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THE GRADUATE SCHOOL BULLETIN
MEMPHIS STATE UNIVERSITY

*The fifty-eighth session will open
Friday, September 12, 1969*

CATALOG 1969-1970

MEMPHIS, TENNESSEE

MARCH 1969

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SECOND SEMESTER, 1970

JANUARY 31, SATURDAY	Registration, The Graduate School, 9:00 A.M.
FEBRUARY 2, MONDAY through	Registration. For detailed dates and times see <i>The Schedule of Classes</i> for the Spring Semester, 1970.
FEBRUARY 4, WEDNESDAY	Classes meet as scheduled.
FEBRUARY 5, THURSDAY	Last day for adding courses.
FEBRUARY 11, WEDNESDAY	Last day for dropping courses.
FEBRUARY 25, WEDNESDAY	Last day for making application to dean of appropriate college for degrees to be conferred in May, 1970.
MARCH 9, MONDAY	
MARCH 27, FRIDAY through	Spring holidays.
APRIL 3, FRIDAY	
MAY 22, FRIDAY	Final examinations begin.
MAY 30, SATURDAY	Commencement.

THE SUMMER SESSION, 1970

FIRST TERM

JUNE 7, SUNDAY	Dormitories will open at noon.
JUNE 8, MONDAY and	Registration. For detailed dates and time see <i>The Schedule of Classes</i> for The Summer Session of 1970.
JUNE 9, TUESDAY	Classes meet as scheduled.
JUNE 10, WEDNESDAY	Last day for adding first-term or second-term courses.
JUNE 12, FRIDAY	Last day for dropping first-term courses.
JUNE 16, TUESDAY	Last day for dropping two-term courses.
JUNE 23, TUESDAY	
JULY 3, FRIDAY through	Independence Day recess.
JULY 5, SUNDAY	
JULY 16, THURSDAY	Final examinations.

SECOND TERM

JULY 20, MONDAY	Registration. For detailed dates and times see <i>The Schedule of Classes</i> for The Summer Session, 1970.
JULY 21, TUESDAY	Classes meet as scheduled.
JULY 23, THURSDAY	Last day for adding second-term courses.
JULY 24, FRIDAY	Last day for making application to the dean of appropriate college for degrees to be conferred in August, 1970.
JULY 27, MONDAY	Last day for dropping second-term courses.
AUGUST 21, FRIDAY	Final examinations.
AUGUST 22, SATURDAY	Commencement.

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- WOODROW FLANARY, *Associate Professor of Education*
Ed.D. (1954), University of Virginia.
- KURT W. FLEXNER, *Professor of Economics and Finance*
Ph.D. (1954), Columbia University.
- EFRIM FRUCHTMAN, *Associate Professor of Music*
Ph.D. (1954), University of North Carolina.
- JOHN WILKES FUSSELL, *Assistant Professor of Education*
Ed.D. (1955), University of Houston.
- HARRY WILBUR GAY, *Professor of Music*
D.M. (1954), Indiana University.
- LEWIS WILLIAM GODLOVE, *Assistant Professor of Education*
Ed.D. (1961), University of Mississippi.
- JAMES THOMAS GOODWIN, *Assistant Professor of Biology*
Ph.D. (1968), University of Tennessee.

- BOBBY GENE GREER, *Assistant Professor of Special Education*
Ph.D. (1965), University of Texas.
- BRUCE GUNN, *Associate Professor of Marketing*
Ph.D. (1968), Louisiana State University.
- PRADIP KUMAR SEN GUPTA, *Assistant Professor of Geology*
Ph.D. (1964), Washington University.
- CARL W. HALE, *Associate Professor of Economics and Finance*
Ph.D. (1965), University of Texas.
- JOSEPH B. HARKIN, *Associate Professor of Mathematics*
Ph.D. (1968), Illinois Institute of Technology.
- RAYMOND ELLIS HARTLEY, *Professor of Psychology*
Ph.D. (1952), University of Chicago.
- MICHAEL J. HARVEY, *Assistant Professor of Biology*
Ph.D. (1967), University of Kentucky.
- GARRY HAUPT, *Associate Professor of English*
Ph.D. (1960), Yale University.
- RODNEY HENNINGSEN, *Assistant Professor of Sociology and Anthropology*
Ph.D. (1969), University of Nebraska.
- HERBERT ALLEN HERMANN, *Associate Professor of Music*
D.M. (1962), Indiana University.
- GIBSON W. HIGGINS, *Assistant Professor of Chemistry*
Ph.D. (1966), Georgia Institute of Technology.
- JAMES DOAN JACKSON HOLMES, *Associate Professor of Accountancy*
M.S. (1957), University of Alabama; C.P.A. (1959), Mississippi.
- L. W. HOUK, *Assistant Professor of Chemistry*
Ph.D. (1937), University of Georgia.
- WILLIAM HENRY HOWICK, *Associate Professor of Education*
Ph.D. (1963), George Peabody College.
- *LEMLY DAVID HUTT, JR., *Assistant Professor of Psychology*
Ph.D. (1967), University of Arkansas.
- GENE G. JAMES, *Assistant Professor of Philosophy*
Ph.D. (1968), University of North Carolina.
- WILLIAM HOWARD JERMANN, *Assistant Professor of Engineering*
Ph.D. (1967), University of Connecticut.
- ALBERT EDWARD JOHNSON, *Professor of Speech and Drama*
Ph.D. (1948), Cornell University.

*On leave of absence, 1968-69

JOHN T. JOHNSON, *Assistant Professor of Psychology*
Ph.D. (1968), George Peabody College.

LEE R. JOHNSON, *Assistant Professor of History*
Ph.D. (1968), University of Maryland.

DONALD PETER JOHNSTON, *Associate Professor of Education*
Ed.D. (1962), New York University.

BERKLEY KALIN, *Assistant Professor of History*
Ph.D. (1967), St. Louis University.

TROY WILBERT KELLY, *Associate Professor of Educational Administration*
Ph.D. (1966), Southern Illinois University.

CHARLES T. KENNY, *Assistant Professor of Psychology*
Ph.D. (1968), Clark University.

PRABHA KHANNA, *Associate Professor of Psychology*
Ph.D. (1957), University of Colorado.

KARL H. KRAUSKOPF, *Professor of Marketing*
Ph.D. (1932), Northwestern University.

JOSEPH STANLEY LASKI, *Associate Professor of Management*
Ph.D. (1965), American University.

LEON LBOVITZ, *Adjunct Professor of Psychology*
Ph.D. (1958), University of Tennessee.

CHARLES JOSEPH LONG, *Assistant Professor of Psychology*
Ph.D. (1966), Vanderbilt University.

FRANKLIN CORDELL LOWE, *Assistant Professor of Accountancy*
M.B.A. (1960), University of Mississippi; C.P.A. (1965), Mississippi.

DAVID NORMAN LUMSDEN, *Assistant Professor of Geology*
Ph.D. (1965), University of Illinois.

MAX LUSTIG, *Assistant Professor of Chemistry*
Ph.D. (1962), University of Washington.

RAYMOND MARTIN LYNCH, *Associate Professor of Music*
D.M. (1965), University of Michigan.

JAMES RAYMOND MCCANN, *Adjunct Professor of Psychology*
Ph.D. (1955), Vanderbilt University.

WILMER EVERETT MACNAIR, *Associate Professor of Sociology*
Ph.D. (1965), University of Wisconsin.

ROBERT E. MAGOWAN, *Assistant Professor of Technology*
Ed.D. (1967), Texas A&M University.

ROBERT-K. MAIN, *Associate Professor of Economics and Finance*
Ph.D. (1968), University of Kentucky.

STEPHEN D. MALIN, *Assistant Professor of Speech and Drama*
Ph.D. (1968), University of Florida.

- ROBERT R. MARCHINI, *Assistant Professor of Physics*
Ph.D. (1969), Clemson University.
- DAVID L. MARSHALL, *Assistant Professor of Chemistry*
Ph.D. (1966), Auburn University.
- WILLIAM R. MARTY, *Assistant Professor of Political Science*
Ph.D. (1968), Duke University.
- MORRIS H. MIDDLETON, *Assistant Professor of Psychology*
Ph.D. (1969), University of Arkansas.
- JACK E. MILLER, *Assistant Professor of Educational Administration*
Ed.D. (1963), University of Oklahoma.
- NEIL MILLER, *Assistant Professor of Biology*
Ph.D. (1968), Southern Illinois University.
- KELL FREEMAN MITCHELL, JR., *Assistant Professor of History*
Ph.D. (1966), University of Georgia.
- SAM BURGE MORGAN, *Adjunct Professor of Psychology*
Ph.D. (1965), University of Arkansas.
- HARWOOD F. MULLIKIN, *Professor of Engineering*
Ph.D. (1934), Yale University.
- RICHARD B. O'CONNELL, *Professor of German*
Ph.D. (1951), University of Minnesota.
- MICHAEL McDONALD OSBORN, *Associate Professor of Speech and Drama*
Ph.D. (1963), University of Florida.
- GEORGE D. OSBORNE, *Assistant Professor of Music*
M.M. (1964), Indiana University.
- JAMES PAYNE, *Assistant Professor of Biology*
Ph.D. (1968), Mississippi State University.
- HENRY HALL PEYTON, III, *Associate Professor of English*
Ph.D. (1967), Brown University.
- MILTON W. PHILLIPS, JR., *Assistant Professor of Educational Administration*
Ed.D. (1967), University of Tennessee.
- MERRILL MOSELEY POWELL, *Assistant Professor of Education*
Ed.D. (1966), University of Alabama.
- GABRIEL PERRY RACZ, *Professor of Economics and Finance*
Ph.D. (1942), University of Budapest.
- FRANKLIN B. RAINES, *Assistant Professor of Education*
Ed.D. (1968), University of Tennessee.
- JOHN D. RAY, *Assistant Professor of Engineering*
Ph.D. (1968), University of Oklahoma.

LETICIA GAYLE RAYBURN, *Associate Professor of Accountancy*
Ph.D. (1966), Louisiana State University; C.P.A. (1962), Mississippi.

JOSEPH EUGENE REDDEN, *Associate Professor of Education*
Ed.D. (1963), North Texas State University.

JOHN JOSEPH REID, *Associate Professor of Economics*
Ph.D. (1962), University of Virginia.

PRISCILLA RUSHTON, *Assistant Professor of Biology*
Ph.D. (1966), Emory University.

ROY SCHROEDER, *Assistant Professor of Health, Physical Education, and Recreation*
Ph.D. (1968), Florida State University.

WILLIAM RODRICK SEWELL, *Assistant Professor of Psychology*
Ph.D. (1967), University of Alabama.

GEORGE WAYNE SHAMO, *Assistant Professor of Speech and Drama*
Ph.D. (1967), Southern Illinois University.

BILL AL SIMCO, *Assistant Professor of Biology*
Ph.D. (1966), University of Kansas.

CARL EDWARD SKEEN, *Assistant Professor of History*
Ph.D. (1966), The Ohio State University.

CARL DAVID SLATER, *Associate Professor of Chemistry*
Ph.D. (1960), The Ohio State University.

AUGUSTUS SORDINAS, *Assistant Professor of Anthropology*
Ph.D. (1968), Harvard University.

RICHARD STEFF, *Assistant Professor of Music*
M.M. (1960), Eastman School of Music.

JANE STEGEMANN, *Associate Professor of English*
Ph.D. (1961), University of Pennsylvania.

VAUGHN ELDEN STIMBERT, *Assistant Professor of Psychology*
Ph.D. (1967), Florida State University.

MIRIAM DECOSTA SUGARMON, *Assistant Professor of Spanish*
Ph.D. (1967), Johns Hopkins University.

EVERETT L. SUTTER, *Adjunct Professor of Psychology*
Ph.D. (1952), University of Texas.

GEORGE WILLIAM TATE, JR., *Assistant Professor of Biology*
Ph.D. (1967), Louisiana State University.

CHARLES E. TEMPLETON, *Assistant Professor of Accountancy*
M.A. (1962), Memphis State University; C.P.A. (1954), Tennessee.

C. C. THOMPSON, *Assistant Professor of Chemistry*
Ph.D. (1964), University of Mississippi.

DONALD RICKHART THOMSEN, *Associate Professor of Educational Administration*
Ed.D. (1956), University of Florida.

- JOHN OLIVER THOMSON, *Associate Professor of Physics*
Ph.D. (1956), University of Illinois.
- ROBERT D. TICE, *Assistant Professor of Geography*
Ph.D. (1935), St. Louis University.
- ALICIA C. TILLEY, *Assistant Professor of Education*
Ed.D. (1968), University of Illinois.
- ROBERT FLOYD TODD, *Assistant Professor of Education*
Ph.D. (1959), University of Mississippi.
- DANA H. VERRY, *Associate Professor of Business Education and Office Management*
Ph.D. (1957), University of Pittsburgh.
- LAURENCE GRAVES WALKER, *Assistant Professor of Geology*
Ph.D. (1967), Harvard University.
- ROY LAVERN WALKER, *Assistant Professor of Education*
Ed.D. (1967), University of Missouri.
- DONALD FLOYD WALTON, *Associate Professor of Education*
Ed.D. (1965), Baylor University.
- JEANNETTE POOLE WARD, *Assistant Professor of Psychology*
Ph.D. (1967), Vanderbilt University.
- THAYER HOWARD WATKINS, *Associate Professor of Economics*
Ph.D. (1965), University of Colorado.
- YUNG WEI, *Assistant Professor of Political Science*
Ph.D. (1967), University of Oregon.
- DONALD ROGER WELLS, *Associate Professor of Economics*
Ph.D. (1965), University of Southern California.
- JAMES CALDWELL WILLIAMS, *Assistant Professor of Chemistry*
Ph.D. (1964), University of Missouri.
- ROY H. WILLIAMS, *Associate Professor of Management*
Ph.D. (1967), University of Alabama.
- ROSESTELLE BACH WOOLNER, *Associate Professor of Education*
Ed.D. (1966), University of Tennessee.
- ARTHUR L. YEHLER, *Assistant Professor of Psychology*
Ph.D. (1966), University of Miami.
- WILLIAM HENRY ZUBER, JR., *Assistant Professor of Chemistry*
Ph.D. (1964), University of Kentucky.

*An expanding University campus (opposite page) features modern buildings
and the newly-formed Mall in front of the Administration Building.*



General Information

Objectives of The Graduate School.

The Graduate School of Memphis State University is the center of advanced study and research within the University. The basic objectives of The Graduate School are (a) to preserve and disseminate knowledge now available in the humanities, the sciences, and the various professional areas represented by the various departmental graduate faculties; (b) to extend knowledge through basic research; and (c) to prepare men and women to assume a more responsible and useful role in society.

Organization of The Graduate School.

The Graduate School is under the direction of The Graduate Council. The Council is composed of the President of the University, the Dean and Associate Dean of The Graduate School, the chairman of each department offering a graduate major, and a departmental representative for each department offering graduate courses. The Executive Committee of The Graduate Council and The Graduate Dean are empowered to make decisions within the policies approved by The Graduate Council. Three members of the Executive Committee are elected by the Council and three are appointed by the University President.

Students admitted to The Graduate School are responsible to The Graduate Council through the Executive Committee and the Dean of The Graduate School. Any member or associate member of the Graduate Faculty may act as major or collateral area advisers to students in their respective departments.

Library Facilities.

The new 12-story John Willard Brister Library complex was completed in 1968. The library contains about three-quarters of a million items and features a complete Mississippi Valley Collection. In addition, libraries in Law, Chemistry, Education, Engineering, Music, and Communication Disorders are considered to be among the most complete in the Mid-South area.

Computer Facilities.

In addition to the Data Processing Center, the University operates a Computer Center. Whereas the Data Processing Center serves the administrative needs of the University, the Computer Center is available for research and instruction.

Auxiliary Facilities.

The University Center is located on the east side of the mall and was opened in 1968. It houses the University Bookstore and, in addition, provides a variety of food service, recreational, and conference facilities.

Chucalissa, prehistoric Indian town and museum, situated in the southwest corner of Shelby County on Mitchell Road, is operated by the University as a research and training facility. Excavation of the site is being undertaken with students performing the archaeological field work under staff supervision. Adjoining acreage serves as a biological field station. Chucalissa also provides indoor and outdoor archaeological exhibits, open to the public throughout the year.

The University has acquired 129 acres of land, formerly the *Kennedy Veterans' Hospital site* at Park and Getwell. This land will be developed for University facilities and programs.

The 623-acre *Meeman Forest Farm* was a gift to the University from the trustees of the Edward J. Meeman Foundation. The land will be used for biological studies. The late Mr. Meeman was for 31 years editor of the *Memphis Press-Scimitar*.

Speech and Hearing Center.

Located at 807 Jefferson in the Medical Center of Memphis, this facility became affiliated with the University in 1967. It serves children and adults with speech and hearing defects. The University administers and operates the center in cooperation with the board of Memphis Speech and Hearing Center, Inc.

Dormitories and Other Housing.

There are four campus residence halls for women: Mynders Hall, West Hall, Nellie Angel Smith Hall, and Rawls Hall. There are four campus residence halls for men: Hayden Hall, McCord Hall, Browning Hall, and Robison Hall.

In addition to these residence halls, Memphis State University operates the privately-owned Highland Towers and Central Towers. The Towers house men and women in air-conditioned suites. The Towers' cafeterias serve 20 meals per week, cost of which is included in total charges for each semester.

Students interested in housing for married students should contact the University Housing Office.

Extension Division.

Memphis State University has for a number of years conducted general education workshops. The increasing demand for these services has resulted in the organization of an Extension Division. The Extension Division was authorized by the State Board of Education in 1951 to afford an official avenue through which University services could be extended off-campus.

Graduate courses are offered through the Extension Division of Memphis State University at centers where suitable arrangements are made in advance. Regularly employed graduate faculty members listed in this Bulletin teach graduate extension courses. The subject matter taught in extension classes is the same as that offered on campus. Regulations regarding the approval of extension courses toward requirements for the Master's degree are found on page 49 of this Bulletin.

Where circumstances justify, the Extension Division attempts to provide various types of help to organized groups within the service area. This assistance may take the form of such activities as conferences, public addresses, consultative service, and other types of school and community aid. Regularly employed staff members of Memphis State University are available for this service.

To the end that an effective extension service may be conducted by Memphis State University, correspondence is invited with groups or individuals who are interested. Please address correspondence to:

EXTENSION DIVISION
The College of Education Building, Room 400
Memphis State University
Memphis, Tennessee 38111

Admission To The Graduate School.

The Graduate School is open to persons holding the Bachelor's degree from colleges and universities recognized by standard, general or regional accrediting agencies, and whose undergraduate work has been of sufficient quality and scope to enable them to profitably pursue graduate study. Satisfactory scores are required on the Miller Analogies Test or the aptitude phase of the Graduate Record Examination for those students not holding the master's degree. In the event a student intends to seek the Master of Business Administration degree, he must take the Admission Test for Graduate Study in Business. The Department of Psychology requires the Graduate Record Examination score for admission. These tests may be taken in any institution approved to administer it.

Admission to The Graduate School merely gives the privilege of taking course work. It does not in any way imply that the student is admitted to candidacy for an advanced degree.

Application blanks for admission to The Graduate School may be secured from the office of the Dean of The Graduate School; all inquiries should be addressed to him. Students who wish to arrange for the Miller Analogies Test should call or write the Guidance and Testing Office (Administration Building). A \$5.00 fee is charged for the test. It is payable in the Business Office. Registration blanks for the Admission Test for Graduate Study in Business and Graduate Record Examination may be obtained from the Dean of The Graduate School. Students must register at least three weeks before the testing date.

Applicants for admission must submit an application and two official transcripts of their undergraduate and graduate credits before being considered for entrance into The Graduate School. An application fee of \$5.00 is required at the time the applications are submitted. Memphis State University students are not assessed this fee.

Applicants may be required to present evidence of good health, moral character, and intellectual capacity necessary for pursuing graduate study.

Registration and Attendance.

After being notified of acceptance to Graduate School, the student must arrange a personal conference with the Dean or his assistant. During this conference the Dean will assign tentative advisers and will advise as to programs available in The Graduate School.

The student at this early interview will be expected to declare his major and collateral area of study. Students who have previously declared major and collateral areas of study but desire to make a change should arrange a conference with the Dean in order that the records may be revised.

The current *Schedule of Classes* will contain complete information concerning registration procedures.

*NOTE: Undergraduate students at Memphis State University who are enrolled for courses which complete their undergraduate degree may apply for admission as combination students to graduate studies and in special cases be allowed to register for graduate courses not to exceed a total of 15 semester hours of combined course work. In addition, students must have passed the English proficiency test and have an overall 3.0 average for the last year in which they were enrolled.

Adding, Dropping, or Changing Sections.

After a graduate student has completed his registration, changes cannot be made without approval of the Dean of The Graduate School. The adjustment will originate in the office of The Dean, and the change-of-course must have the approval of the student's major adviser and the Dean.

Withdrawing From Graduate School.

Failure to give official notice of complete withdrawal from Graduate School in writing will result in a grade of "F" in each course for which the student was registered.

A withdrawal is not permitted within one week of the beginning of the final examination period of a semester or a summer term. Any student who withdraws after the drop period ends will have all courses not previously dropped recorded as: WP—Withdrew Passing or WF—Withdrew Failing.

Address your notice of withdrawal to:

DEAN, THE GRADUATE SCHOOL
Memphis State University
Memphis, Tennessee 38111

If a student withdraws with an unsatisfactory grade-point average he must secure approval from the Graduate Dean for re-admission. The adviser should examine the graduate transcript before giving approval.

Expenses and Aid



Expenses at University.

The matter of expense while attending the University is of importance to every student. It is difficult, however, to give specific information about yearly expenditures; expenses vary according to the nature of the curriculum, the place of residence (whether in Tennessee or in another state or country), and the student's own habits and needs. In any student body there are so many different tastes, as well as such a wide range of financial resources, that each student must determine his budget in keeping with his own needs and financial condition. It is possible to live simply, and to participate moderately in the life of the student community, on a modest budget. The best help the University authorities can offer the student in planning his budget is to inform him of certain definite expense items and to acquaint him with others for which he will in all probability have to provide.

The information in this section concerning tuition, fees, deposits, financial aid, etc. is applicable only to students enrolled in The Graduate School. Similar information for students in the undergraduate colleges and The School of Law is available in the bulletins of those colleges.

The listing of any fee or incidental charge in this catalog does not constitute a contract between the University and the student. Because of rapidly changing conditions it may become necessary to alter a fee structure before the next edition of the catalog is published. As a condition of registration each student will pay the fees in effect at the time he registers.

Application Fee.

Each student submitting an application for admission to the University must pay, at the time he submits his application, a non-refundable fee of \$5.00 except Memphis State University students.

Maintenance Fee.

All students, whether resident or non-resident, pay a maintenance fee of \$13.50 per semester hour, not to exceed a maximum of \$132.50. Students paying the maximum fee are entitled to certain health services; admission to home athletic events, concerts, plays, social and other student-sponsored activities; and a subscription to *The Tiger Rag*, the student newspaper.

Tuition.

No charge is made for tuition to bona fide residents of the State of Tennessee; non-residents are charged \$240.00 per semester (for full-time students) or \$22.00 per semester hour (for part-time students).

The following policy is applied by the State Board of Education in classifying students as residents or non-residents for purpose of assessing tuition charges:

As a general rule the residence of a student is presumed to be that of his parents or guardians on the date of his enrollment at Memphis State University. "Residence" is interpreted to mean the state in which the parents or guardians are domiciled. "Guardian" is interpreted to mean a bona fide legal guardian appointed by the courts for purposes other than the establishment of residence for the purpose of avoiding payment of non-resident tuition. The residence of a married student (minor or adult) or the residence of an unmarried adult student shall be presumed to remain that of his parents or guardians unless he has independently established a residence of his own. The fact that such a student owns and dwells in his own home in Tennessee shall be sufficient evidence to classify him as a Tennessee resident.

The office of the Dean of Admissions and Records shall make the original decision concerning residence classification. The student may appeal this decision to the Committee on Residency; he may also petition this committee at a later date, if circumstances change, to reconsider his classification. Further information about residence classification may be obtained from the Dean of Admissions and Records.

The Summer Session.

The Summer Session consists of two separate terms of approximately six weeks each. Charges are assessed, however, not by the term but either (1) for the entire two-term Session or (2) on a semester hour basis. The charge for the entire Session (during which the student may take a maximum of twelve semester hours) is \$95.00 to residents of Tennessee, \$255.00 to non-residents. The semester-hour charge is \$13.50 per semester hour to residents, \$35.50 per semester hour to non-residents.

The student must indicate his choice of payment plan (either for the full two-term Session or per semester hour) at the time of his initial registration; he may not shift from one plan to the other thereafter. No part of his payment is returnable unless he withdraws from the University within the period during which refunds are allowed. If, for example, he pays for the entire Session and then enrolls for fewer than the maximum number of hours allowed him, or if he decides to attend only one term, no part of his \$95.00 (or \$255.00) payment will be refunded. The student who wishes to attend for only one term or to take fewer than seven semester hours in two terms should, for his own benefit, pay at the semester-hour rate.

Fee Refunds.

If a student withdraws from the University within seven days after the beginning of classes for the fall and spring terms, a refund will be made of 80% of his maintenance fee and tuition or music fee (if any). Each week thereafter, the amount will be reduced 20%. *All other fees are non-refundable.*

For The Summer Session a refund of 80% of the maintenance fee and tuition or music fee (if any) is made if the student withdraws from the University within three school days after the beginning of classes. Each three school days thereafter, the amount will be reduced 20%. *All other fees are non-refundable.*

Residence Halls.

Charges for rooms in University residence halls* are indicated below. For information concerning application for rooms, contact the Office of University Housing.

	PER SEMESTER	PER SUMMER TERM
Rawls Hall (air conditioned)	\$169.00	\$ 52.00
Robison Hall (air conditioned)	\$152.00	\$ 44.00
Central and Highland Towers		
(air conditioned and 20 meals)	\$519.00	\$178.00
(air conditioned and 15 meals)	\$484.00	not available
Hayden Hall (graduate men; single room) ..	\$169.00	\$ 52.00
All other residence halls	\$147.00	\$ 46.00

Residence Hall Contract, Deposit and Rental Fee.

The following policy shall be in effect beginning with the Fall semester 1968 covering residence hall contracts, deposits and rental fees:

1. All residence hall contracts are for the academic year or any portion thereof and cover residency each succeeding year until cancellation or withdrawal from the University.

Telephones are provided in each student's residence hall room except in Robison Hall. Charges for local service are included in the residence hall rent. A Student Telephone Account Number (STAN) is issued to each student upon entrance to the hall. Long distance calls are to be charged to this STAN number. Long distance calls charged to the actual telephone number will be prosecuted as fraudulent calls by the South Central Bell Telephone Company. Students having outstanding telephone charges at the close of a semester will not be readmitted to the hall until charges are paid in full.

*All rates include telephone (except in Robison Hall) and post-office box, but *not* long-distance telephone tolls.

Assignments to the residence halls are made in order of completed applications and advance rental payments received. Returning students have priority for space. Although every effort is made to place a student with a compatible roommate, the University cannot guarantee to comply with all requests.

2. Each application for residence hall accommodations must be accompanied by a deposit of \$25. This deposit against damages shall remain on file with the University throughout the student's occupancy of housing facilities, and is refundable only under the following conditions:

- A. When written request is received in the Housing Office prior to July 15 for the Fall semester, January 5 for the Spring semester, and May 1 for the Summer term.
- B. When a student is denied admittance or re-entry to the University.

Approved refunds will be reduced by the amount of any unpaid damages at the time residence hall space is vacated.

3. Initial applications for residence hall accommodations in halls other than Highland or Central Towers must be accompanied by an advance rental payment of \$40.00 which will be applied to total rent at registration. (This is in addition to the \$25 deposit mentioned above.)

4. Students who wish to retain their rooms for subsequent semesters must make this advance payment by July 15 for the Fall semester and by January 5 for the Spring semester.

5. No prepayment or rent is required for the Summer term.

6. Refunds of the \$40.00 advance rental payment will be made only when the following conditions exist:

- A. The student is denied admittance or re-entry to the University.
- B. The student is prevented from entering the University because of medical reasons, such reasons confirmed in writing by a licensed physician.
- C. The student is inducted into the armed service involuntarily. This does *not* include voluntary enlistment or the call to active duty by a student who voluntarily enters reserve duty.

D. Residence hall space is not available.

E. Reservations are cancelled prior to July 15 for the Fall semester and January 5 for the Spring semester.

7. Refunds of residence hall rent after classes begin will be prorated on a weekly calendar basis when the following conditions exist:

- A. The student is forced to withdraw from the residence hall because of medical reasons, such reasons being supported by a statement from a licensed physician.
- B. Armed forces inductions as in item 6C above.

Meals.

The University Cafeterias, Student Centers, and Vending Areas, open to all students, provide wholesome food at reasonable prices. The cost of meals per student is estimated at \$2.50 per day.

Late Registration.

Students who do not complete registration (including the payment of fees) during the official registration period will be charged \$5.00 for the first day after the official registration period and \$1.00 per day thereafter.

Adding and Dropping Courses.

A charge of \$3.00 per course will be made for each course which is added or dropped after the student has completed registration.

Late Examinations.

A student who is permitted to take a final examination at a date later than the one on which the examination was originally scheduled will be charged \$1.00 per examination.

Transcripts.

One transcript of the student's academic record at Memphis State University is furnished free; a charge of \$1.00 is made for each additional copy requested. Transcripts are issued only at the request of the student or his authorized agent. No transcript will be provided for a student who has any financial indebtedness to the University.

Automobile Registration.

Each person who expects to operate and park an automobile on the campus must register it in the traffic office (Room 130, Administration Building) and pay \$3.00 for an official permit, valid from September through August.

Identification Cards.

The University issues to each student an identification card, including his photograph, personal description, and certificate that he is enrolled as a student in the University. The card is required for registration, the borrowing of library books, the cashing of personal checks, and other purposes. *The card remains the property of Memphis State University*; a charge of \$10.00 will be required for its replacement.

Bad Checks.

It is expected that a check given in payment of any fee will clear the bank on which it is drawn. *If a check is returned, the fee is assumed to be unpaid and charges for late payment will be assessed.* A \$2.00 service charge will be assessed for each bad check, whether given in payment of fees or cashed by the University for the personal convenience of the student. Check-cashing privileges will be revoked for any student who has had checks returned by his bank more than once.

Laboratory Deposits.

Certain courses in chemistry and physics require breakage deposits, any unused portion of which is refunded.

Courses in Applied Music.

The fee for all private lessons in brasses, organ, percussion, piano, strings, woodwinds, and voice is \$50.00 (those currently registered for music theory) per half-hour lesson per semester. Those students who are majoring in music will pay only one \$50.00 fee per semester.

Additional Charges.

The University reserves the right to increase the charges listed herein or to add new ones whenever such increases or additions are found to be necessary.

Thesis.

The student will be required to present a receipt from the Business Office to the Graduate Office showing that he has paid a fee of \$2.50 for each copy of his thesis which is to be bound.

Dissertation.

A student completing the doctorate will be required to pay the \$2.50 fee for binding each copy of his dissertation and in addition

a fee of \$35.00 to defray the cost of microfilming the dissertation and publishing the abstract.

Diploma Fee.

Each candidate for a degree from Memphis State University pays a \$15.00 fee to cover cost of the diploma, rental of cap and gown, and incidentals connected with the commencement exercises. This fee must be paid thirty days before graduation.

Graduate Assistantships.

MASTER'S LEVEL ASSISTANTSHIPS. Graduate assistantships for Master's degree students are available in most of the academic areas at Memphis State University. Full time assistants may anticipate from \$200 to \$250 per month and remission of registration fees.

DOCTORAL ASSISTANTSHIPS AND FELLOWSHIPS. Numerous opportunities are available for qualified students to participate in N.D.E.A., N.S.F., N.I.H., Industrial and Private Foundation Awards made to the University. Inquiries should be made to either the Departmental Chairman or Director of Graduate Studies of the appropriate department

RESIDENCE HALL ASSISTANTS. Resident advisers have full responsibility for a residence hall. They are provided with living quarters and are paid approximately \$200 per month. Floor counselors are responsible for a floor and are provided with a room and a stipend each semester.



Graduate Programs

Graduate Programs.

A wide variety of graduate programs of study are offered in The Graduate School of Memphis State University. Candidates for a degree must design a plan which has the approval of their major adviser.

Memphis State University offers Master's degrees, Education Specialist degrees, and Doctoral degrees. The Masters' programs are: Master of Arts (M.A.), Master of Arts in Teaching (M.A.T.), Master of Business Administration (M.B.A.), Master of Education (M.Ed.), Master of Music (M.M.) Master of Science (M.S.), and the Master of Science in Teaching (M.S.T.). In the area of Education, the degrees of Education Specialist (Ed.S.) and Doctor of Education (Ed.D) are offered. The Doctor of Philosophy (Ph.D.) is awarded in Chemistry and Psychology.

Every graduate student is expected to comply with the general requirements for the degree he is pursuing, as outlined elsewhere in the *Graduate School Bulletin*. In addition to the general requirements, the student will be expected to conform to the requirements of one of the departments of the University. The choice of the department in which the student is to major may, in large part, determine the degree he will seek, since the graduate degree should reflect the type of program the student has followed.

Master's Degree.

The program for the MASTER OF ARTS degree is generally open to those who have completed the Bachelor of Arts degree. Others may enroll for the M.A. degree if undergraduate prerequisites are met. Departmental requirements with reference to thesis, language, and course requirements are outlined on pages 58 to 175 of the Bulletin. Students majoring in the following areas are generally expected to seek the Master of Arts degree: English, Geography, History, Modern Languages, Music (Applied), Music History, and Music Theory, Political Science, Psychology, Sociology, and Speech and Drama. Economics majors may choose to apply for this degree also.

The programs for the MASTER OF ARTS IN TEACHING degree are designed for a selected group of students who offer outstanding undergraduate academic records. The degree is awarded in the Department of Elementary and Secondary Education. Either of two programs may be elected by the student in consultation with his major professor:

A. FOR STUDENTS SEEKING CERTIFICATION: A minimum of 24 hours of Education courses and a minimum of 12 hours in non-Education courses, as approved by the student's

major professor. Generally, the student will take his non-Education courses in the field of his undergraduate major.

Candidates for the Master of Arts in Teaching degree who have not completed the student teaching experience at the undergraduate level will be required to do so at the graduate level, in which case a minimum of 36 hours is required for the degree.

B. FOR STUDENTS ALREADY CERTIFIED: A minimum of 18 hours of Education courses and a minimum of 15 hours of non-Education courses, as approved by the student's major professor.

In the event the student wishes to change his teaching field from his undergraduate major he will be required to meet the departmental prerequisites and teaching certification requirements. The student may prepare in more than one discipline if he is seeking a teaching endorsement in more than one field. Students may seek certification in any graduate area for which there is an undergraduate endorsement.

The Master of Arts in Teaching degree may be earned without the presentation of a thesis. No provision is made for thesis credit within the total hours required for the degree.

Students who wish to pursue the MASTER OF BUSINESS ADMINISTRATION degree must have completed or complete satisfactorily the proper background courses. Except for the M.A. Degree in Economics (see page 79), Core I below lists the courses required for background. Students deficient in background courses must remove the deficiency prior to starting graduate work.

CORE I	CREDITS
Fundamentals of Accounting	6
Principles of Economics	6
Basic Marketing	3
Business Finance	3
Business Statistics	6
Business Law	3
Organization and Management	3
TOTAL	30

The total number of credits for Core I background courses is 30.

The master of Business Administration program is designed for students who have earned the Bachelor's Degree from Arts and Sciences, Engineering, or other areas of study, as well as those who hold a Bachelor's Degree in Business Administration. Students with adequate preparation in Business Administration and Economics may complete the program in a minimum of three semesters

(one calendar year). A period of five semesters is normally required of students who have no undergraduate work in business.

Each candidate for an M.B.A. degree must complete a minimum of 33 semester hours of course work and pass a written and/or oral examination. The 33 graduate credits comprising the M.B.A. program (Core II) are distributed as follows:

CORE II

Required Courses

Economics 6320	Macroeconomic Theory	3
Management 7420	Quantitative Methods for Business Decisions	3
Accounting 7010	Cases and Problems in Decision Making	3
Business Finance 7610	Analysis and Control of Business	3
Marketing 7012	Marketing Structure and Administration	3
Management 7410	Seminar and Business Policy	3
And one of the following:		
Marketing 7015	Research Methodology	3
Economics 7140	Business and Economic Research	3
Business Education 7530	Executive Communications	3
		<hr/>
		TOTAL 21

Concentration and Electives: Courses in the area of concentration are selected from the areas of graduate study listed above. Nine of these twelve hours must be taken in the selected area of concentration.

CORE II TOTAL

 33

Master of Arts and Master of Science: The Master of Arts degree program is offered in the area of economics and Master of Science degree programs are available in accountancy, business finance, marketing, and management. Descriptions of these programs are found in the appropriate department section.

The program for the MASTER OF EDUCATION degree is generally open to those who have completed the requirements for teacher certification. Departmental requirements with reference to thesis, research and course requirements are found on pages 58 to 175 of the Bulletin. Those who are majoring in the following areas may seek the M.Ed. degree: Elementary Education; Secondary Education; Special Education, Guidance and Counseling; Reading; Health, Physical Education, and Recreation; Music Education; Educational Administration and Supervision; and

Business Education and Office Management; and Distributive Education.

The program for the MASTER OF MUSIC degree is generally open to students specializing in one of the following areas: Applied Music, Music Theory, and Music History and Literature. This degree is designed for those who have completed the Bachelor of Music degree in one of the above specified areas.

The program for the MASTER OF SCIENCE degree is generally open to students with a science background. Departmental requirements with reference to thesis, language, and course requirements are outlined on pages 58 to 175 in the Bulletin. Those who are majoring in the following areas may seek the Master of Science degree: Biology, Chemistry, Engineering, Geography, Geology, Mathematics, Physics, and Psychology. Students majoring in Accountancy, Business Finance, Marketing, and Management may also apply for the Master of Science Degree Program.

The program for the MASTER OF SCIENCE IN TEACHING degree is designed to prepare baccalaureates to assume a significant role in improving instruction at the secondary level in the natural sciences or mathematics. Those candidates who do not hold a teaching certificate may enroll in the program and may be required to qualify for certification before the degree is awarded. Courses may be in biology, chemistry, physical geography, geology, physics, and mathematics. A minimum of 33 semester hours is required with at least 21 semester hours in either (a) mathematics, or (b) combined natural sciences, and/or mathematics, and 9 to 12 hours in collateral areas. Under Option b, the nominal major may include a minimum of 9 semester hours in a particular science discipline (e.g. chemistry), 6 semester hours in a secondary science (e.g. physics), and 3 semester hours in a third area of science. Any student who has not completed 6 semester hours in mathematics above the equivalent of the freshman 1000 level is required to do so. If a student has completed the mathematics requirement he may select one mathematics course of 3-4 semester hours at the 6000 or above level to count in his major. Specific requirements for any science, including any credits in a second and third science and a credit in non-science areas or education, may be determined by the departmental chairman or the major adviser.

For the collateral area in both options, students may take up to 9 semester hours in The College of Education and upon the approval of the major adviser up to 9 semester hours in a non-science area.

Credit for a thesis is not allowed. Students may consult the departmental chairman concerning the specific details of the program.

General Requirements for Graduate Degrees.

Every graduate student and every prospective graduate student is expected to make himself thoroughly familiar with the regulations of The Graduate School and the requirements for degrees. Failure to follow the regulations and requirements almost inevitably results in complications for which The Graduate School cannot assume responsibility.

Master's Degree.

The Master's degree program shall include 30-33 semester hours of course work as follows. The student's program should be approved by the major department. In some cases, 18-24 semester hours are required in a major area and 8-12 semester hours in a collateral area.

A thesis of 3 to 6 semester hours may be presented as partial completion of degree requirements. If a thesis is presented, the student may be graduated with a total of 30 semester hours of which a minimum of 18 semester hours, exclusive of the thesis, shall be in the major field.

If no thesis is submitted, the overall degree requirements shall be 33 semester hours, with a minimum of 21 semester hours in the major area.

All requirements for the degree must be completed within six years from date of the candidate's original registration for graduate courses. Only under unusual circumstances can this requirement be waived, and then, only by the Dean of The Graduate School at the request of the major adviser.

At least 18 semester hours of the courses in a student's program must be of the type designated as primarily for graduate students (7000 level courses). At least 12 semester hours of this must be done in the major. The department in which the collateral area is taken will determine whether or not any 7000 level courses are required.

Work done by graduate students registered for 6000 courses must be of a higher quality than that required of undergraduates. Also, the graduate student is required to do additional work. This may consist of independent study or of such other work as the instructor may demand.

Courses of 6000 level are offered as undergraduate courses with 4000 level numbers. A student may not receive credit for a 6000 level course if he has credit at the 4000 level.

Courses are numbered according to the following system:

4000-4999—Courses primarily for seniors and for which graduate credit is not offered

5000-5999—Courses offered in The Graduate School but open to seniors within 36 hours of graduation (degree credit not allowed).

6000-6999—Senior courses open to graduate students

7000-7999—Courses open only to graduate students

8000-8999—Courses open primarily to post-Master's students

Amount of Work Permitted.

Sixteen semester hours shall be the maximum load for students devoting full time to graduate study. Only full time students may register for twelve semester hours of course work in any one semester, including courses on campus, extension courses, and courses to be transferred from other institutions.

Graduate students who are employed on a full time basis usually may not register for more than two courses.

A student may register for 18 semester hours during his final academic semester for the purpose of graduating, if he has had a 3.5 average on previous graduate studies completed.

Certain residence courses, designated as "problems courses," or special individual research topics, are described in this bulletin. Seven semester hours of credit in problems or research courses may be applied to degree requirements (4 to a major area or 4 to a collateral area) if the student has both a major and a collateral area. If the student does not have a collateral area, he may not apply more than 4 semester hours of special problems courses toward meeting degree requirements. Students are not allowed to register for more than one problems course in any one semester or full summer term.

Admission To Candidacy For The Master's Degree.

To become a candidate for a degree, the student must file an application on blanks available at the office of the Dean. The student must indicate on the application the degree program he is choosing. The application must contain plans for a complete program of graduate study and be approved by a faculty adviser in both the major and collateral areas.

Before the "Application for Admission to Candidacy for the Master's Degree" can be approved and the applicant can be officially admitted to candidacy for a Master's degree, the student must have satisfied the following requirements:

1. He should file Application for Admission To Degree Candidacy after 12 semester hours of graduate work in residence.
2. He must have completed prerequisite undergraduate requirements of not less than 18 semester hours in his graduate major area.
3. He must have at least a "B" average on all graduate work immediately preceding the date of the application for degree candidacy.
4. The general field of his thesis must have been approved after admission to candidacy has been established, if his program includes the requirement of a thesis.
5. His graduate work up to this point must be acceptable in quality and quantity to his major adviser, departmental chairman and/or director of graduate studies.
6. His entire program must conform to the general regulations of The Graduate School and the requirements for his particular major.

Every student who files an "Application for Admission to Candidacy for the Master's Degree" will receive from the Graduate Office an approved copy of the application or a letter explaining why approval has been withheld.

Audit Courses.

Students who are registered for one or more classes at Memphis State University may also register to audit a course with the approval of their adviser and the chairman of the department in which the course will be offered. Auditors are not to prepare lessons or papers, or take examinations. They are not to take part in class discussions or laboratory or field work.

Persons who are not enrolled for credit courses may register for audit courses with the approval of the Dean of Admissions and Records and the department chairman.

Students enrolled for credit courses may take no more than one audit course per semester. Persons who are not enrolled for credit courses may register for a maximum of three courses with the approval of the department chairman.

Fees for audits will be assessed on the same basis as fees for credit courses.

Credit for Work Completed Elsewhere and by Extension.

Credit earned at another institution must be presented for consideration at the time the student applies for degree candidacy. There is

no automatic transfer of credit toward a graduate degree, but, in general, residence work completed at another accredited graduate school may be accepted for not more than six semester hours of course credit toward a Master's degree. No transfer of credit will be approved if the grade point average for graduate work attempted is less than three on a four point system. No credit will be transferred unless it meets with the approval of the major adviser.

Six semester hours of course work completed through the Memphis State University Extension Division may be applied toward degree requirements, provided it meets the approval of the major adviser.

Extension work taken with another institution is not transferable.

Six semester hours of transfer work may be applied toward degree requirements.

Not more than nine semester hours of any combination of extension work and work completed elsewhere may be credited toward the course requirements for the Master's degree.

Graduate credit is never granted for courses taken by correspondence.

Grades.

The grades which may be awarded are as follows: A—B—C (the lowest grade for which graduate credit is allowed)—D—F, I (Incomplete), P (In progress), and W (withdrawn).

The grades for research, thesis, and dissertation courses shall be "U" or "S". Letter grades are given for special problems courses.

An average grade of "B" must be maintained in ALL graduate work, and credit earned with a "D" grade may not be counted toward meeting any requirements for the Master's degree.

Work with a grade of "F" will be included in the grade average computation.

Not more than 7 semester hours of credit with a grade of "C" may be applied toward meeting the degree requirements, and not more than 4 semester hours of "C" may be accepted in the major.

A grade of "I" on regular Course Work will become an "F" unless removed within the first four weeks of the next semester that the student is in residence. The deficiency, however, must be corrected within one calendar year from the date the "I" was recorded.

Instructors of problems courses shall be allowed to give a grade for "work in progress" (P) to extend the time for the completion of such research. In the event this time extension is for longer than one calendar year, the responsible instructor shall present a written recommendation to the Office of the Dean of Admissions and to the Dean of The Graduate School for an official dropping of the course or for the assignment of a specific grade.

A student who fails to earn thesis credit at the end of one academic semester following the registration for the total thesis credits allowable will be required to renew his thesis status. In order that he remain in active status, the Master's degree candidate will be required to register for 3 semester hours of thesis credit. This renewal of active status must be continued each academic semester until the thesis is completed. Registration in either term of summer school will fulfill the requirement for the summer. Credit will be posted upon completion and acceptance of the thesis, but no more than 9 hours will be allowed for a Master's thesis, even though the student may have been required to register for additional hours in order to remain in active status. The registration may be waived for any semester, if the student's adviser is not available or for other reasons approved by the department chairman.

Comprehensive Examination for the Master's Degree.

Before being recommended for graduation, every candidate for the Master's degree is required to pass a final comprehensive examination in his major and in his collateral area; it may be oral or written or both, at the discretion of the departments concerned.

A student will not be permitted to take the comprehensive examination before his application for Degree Candidacy has been approved.

It is the student's responsibility to confer with his major and collateral area departments regarding the time and place of the examination. No reminders will be sent him by the Graduate Office.

Statement of Intention to Graduate.

Candidates for the Master's degree must file a statement of intention to graduate with the Dean of The Graduate School at the beginning of the semester, or session, in which the academic requirements for the degree are to be completed. The degree desired shall be shown on the application form.

A student is not allowed to graduate in the last semester

unless a "B" average is maintained for all semesters. Grades made the final semester are not allowed to average deficiencies. He will be permitted to graduate the subsequent semester.

To facilitate communication, graduate students are expected to notify the Graduate Office of their changes of address. They should remember that all details connected with their work center in the Graduate Office.

Doctoral and Specialist Degrees.

Three Post-Master's degrees are offered by the Graduate School. These are the Education Specialist degree (Ed.S.), the Doctor of Education degree (Ed.D), and the Doctor of Philosophy degree (Ph.D.). The Education Specialist degree is a one-year program beyond the Master's degree with the additional requirement of a thesis. The Ed.D. and Ph.D. programs require a minimum of two years beyond the Master's degree.

Doctor of Education.

The doctorate in Education is available in three areas: Administration and Supervision, Curriculum and Instruction (general), and Personnel Services. Students who have been admitted to candidacy will be expected to complete no less than 12 to 18 semester hours of course work and write a dissertation. Students should apply for candidacy as soon as possible, in order that a departmental advisory committee can be established to advise them concerning the program to follow.

Each student's program will be designed to give him a background of knowledge which is deemed to be desirable for his declared objectives. In general, all candidates for the doctorate will be expected to have had, or to complete, a core of courses in any three of the following broad fields: the behavioral sciences, the social sciences, educational foundations or philosophy, and measurement and evaluation or statistics.

To be eligible to receive the Doctor of Education degree, the student must have had a minimum of two years of acceptable experience in teaching or other appropriate educationally-related work. An approved internship may apply as a year of experience, but it may not satisfy more than half of the residence requirement. If the internship is to be used to meet a part of the residence requirement, it must have the recommendation of the department in which the student is pursuing a major.

Candidates for the Doctor of Education degree will take courses in two areas other than the major. Usually at least one area of study should be outside the field of Education. The total

hours outside the major area should not be fewer than 18, with no less than 6 hours in either of the two areas of study. The collateral areas may be chosen from any University department that has been approved to offer a major at the Master's level, provided the areas are appropriate to the student's objectives and are approved by the departmental graduate advisory committee.

Each student admitted to candidacy must register for the doctoral seminar, a course open only to doctoral candidates. Each student will be expected to develop a dissertation outline and present it as a part of the course requirements. Participants in the seminar for doctoral candidates will be graduate faculty members of The College of Education and departmental advisory committee members.

Doctor of Philosophy.

The Doctor of Philosophy degree is offered by the Departments of Chemistry and Psychology. The general requirements for the Ph.D. degree are outlined in the statements dealing with doctoral degrees. More detailed information about prerequisites, course work, research requirements, and degree programs can be obtained from the chairman of the respective Department or Director of Graduate Studies. Any department may choose to admit a student to doctoral study without requiring the master's degree as a prerequisite.

Education Specialist.

Students who wish to become candidates for the specialist degree will observe all of the general Post-Master's requirements which are applicable. For more specific information, students should read the statements of the Curriculum and Instruction Department and the Educational Administration and Supervision Department. The student should consult his departmental advisory committee concerning the qualifying examinations, admission to candidacy, and thesis requirements.

Admission to Post-Master's Courses.

Students follow regular admission procedures to enroll for Post-Master's credit. Those who hold Master's degrees from accredited colleges or universities should attempt to present Graduate Record Examination scores prior to the initial registration, but this is not required for admission. Any department may deny the student registration privilege if he lacks academic preparation, if he has inadequate grades, if he fails to present required test scores, or for other valid reasons. A student's initial enrollment in no way

should be taken to mean that he has been accepted for degree candidacy. It is important that the student declare his intentions as soon as possible after his initial enrollment in order that candidacy status may be established. When the student is admitted to candidacy, his departmental graduate advisory committee will plan a complete program. Not until this time will the student's status be clearly defined.

Faculty members of the University will not be permitted to enroll in a doctoral degree program. They may enroll in courses for the purpose of transferring credits to another institution or they may enroll for personal improvement.

Admission to Candidacy.

As soon as possible after the student has enrolled in course work he should confer with his department advisor as to the department's policy concerning the completion of his application for degree candidacy. No student will be admitted to degree candidacy until the proper forms are approved by the departmental chairman or Director of Graduate Studies and the Graduate Dean and filed in the Office of the Dean of The Graduate School. Forms are available in the Graduate Office (Room 332, Administration Building). Failure to discuss long-range degree plans with the departmental advisor and the Graduate Dean may result in misunderstandings and misconceptions on the part of the student.

Each person applying for candidacy will be required to take a qualifying examination administered by the department in which the student wishes to major. The examination may cover specialized knowledge and general knowledge; writing skill will also be considered. To be eligible to take the departmental qualifying examination, the student must have presented scores on the Graduate Record Examinations (aptitude and an advanced test) to the Graduate Dean. The test scores, transcripts and other pertinent data will be examined by a graduate departmental committee approved by the Graduate Dean. All students who are allowed to enroll for Post Master's courses are not necessarily eligible for the privilege of taking the departmental qualifying examination. Low scores on the Graduate Record Examination and/or an unsatisfactory grade average may prevent a student from taking the qualifying examination.

It is not advisable for a student to pursue a doctoral program in an institution from which he has obtained all of his prior degrees. A student in this category must have an exceptionally strong recommendation in writing from the department in which he wishes to major and then be approved by the Graduate Dean.

Minimum Residence Requirements.

The minimum resident requirement for a doctorate is three full years of graduate study (72 semester hours) of which at least one year (24 semester hours) shall be spent at Memphis State University. The requirement cannot be met wholly by attendance at Summer Sessions. Candidates for the Ed.S. degree will spend one full semester in residence, or two summers for both terms. Every candidate for the Ph.D. must pay tuition fees for the equivalent of three years of full time study, unless he has received credit for work done elsewhere.

Research Requirements.

An acceptable dissertation is a requirement for all doctoral degrees. The dissertation must embody the results of an extended research effort which is an original contribution. It should reflect the candidate's ability to conduct independent research and interpret in a logical manner the facts and phenomena revealed by the research. The student will be required to meet the specific regulations of the department in which he is majoring.

Ed.S. degree candidates will present a six-hour thesis based on research related to the graduate major. Ed.D. degree candidates will present dissertations for a maximum of 12 hours of credit. Ph.D. degree candidates will present dissertations for 9-30 semester hours of credit depending on departmental policy.

A student who fails to earn dissertation credit at the end of one academic semester following the registration for the total credits allowable will be required to renew his dissertation status. In order that he remain in active status, the candidate will be required to register for 3 semester hours of dissertation credit. This renewal of active status must be continued each academic semester until the dissertation is completed. (The summer term will be considered an academic semester for this purpose.) Credit will be posted upon the completion and acceptance of the dissertation, but no more than 6 hours will be allowed for an Ed.S. thesis and no more than 12 hours for an Ed.D. dissertation, even though the student may have been required to register additional hours in order to remain in active status. This requirement may be waived for any semester the adviser is not on the campus or for other research approved by the department chairman.

The candidate will be required to present to The Graduate School three copies of his dissertation to be bound. In addition, the student should provide a bound copy of his dissertation to both the chairman of his doctoral committee and the chairman of his department. The dissertation, which will be microfilmed, must

be accompanied by an abstract of not more than 600 words. The abstract will be published. Fees to cover the cost of microfilming and publishing are specified elsewhere and are to be paid by the student.

Time Limitation.

Credit earned more than ten years prior to the doctoral student's graduation cannot be applied toward meeting prerequisites or collateral requirements, unless approved by the student's departmental advisory committee.

None of the last thirty-three semester hours of credit that is presented for fulfillment of the requirements for the Ed.S. shall have been earned more than six years prior to the student's date of graduation.

Course Load Limitations.

Full-time Graduate students may enroll for a maximum of 16 semester hours. Those who register for 10 or more hours and devote a regular five-day week to study may be considered as full-time students. Graduate assistants who are responsible for the equivalent of two classes may register for no more than 9 semester hours; exceptions may be approved by the Graduate Dean upon the recommendation of the department. Students who are employed full-time may register for no more than 6 semester hours.

Acceptance of Credit Toward Degree Requirements.

Credit earned in another institution must be presented for consideration at the time the student is accepted for candidacy. Upon the approval of the student's department advisory committee, the credit will be transferred to apply toward the Ed.S., Ed.D., or Ph.D., provided that the credit meets general University requirements. Not more than one year of transfer work beyond the master's degree can be applied to requirements for the Ed.D. or Ph.D. degrees. Only six hours of transfer credit will be permitted for the Ed.S. degree. No credit will be allowed toward specialist or doctoral degrees for correspondence courses, extension courses, or special short courses.

Comprehensive and Final Examinations.

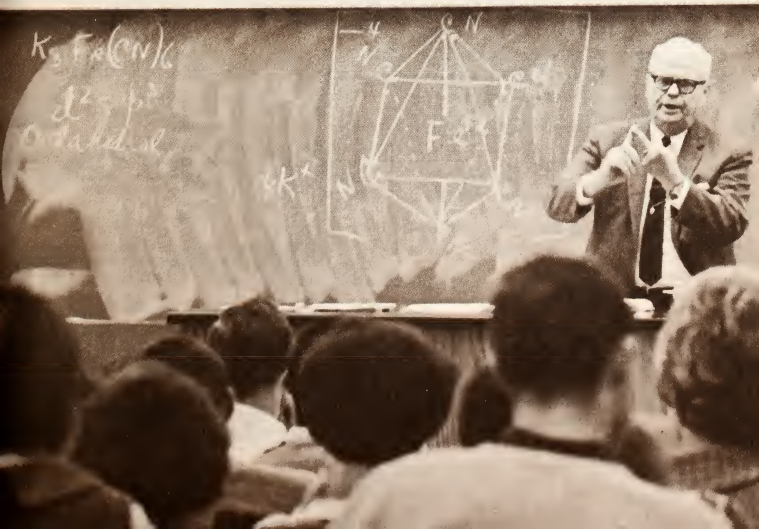
A comprehensive examination may be required by a department prior to approval of a dissertation topic. After the completion of the dissertation and all the prescribed work for the degree, the doctoral candidate will be given a final examination by a committee composed of departmental and University representatives.

An announcement of the scheduled examination must be sent to the Dean of The Graduate School at least one month prior to the scheduled date. If the student's performance on this examination is satisfactory, he will have completed all requirements for the degree.

Lecture sessions in Chemistry (opposite page) are supplemented by laboratory study. Graduate work is offered in chemistry, biology and physics.

II B	III A	IV A	V A	VI A	VII A	0
						2
						He
						4.0
						10
5	6	7	8	9		Ne
B	C	N	O	F		
10.8	12.0	14.0	16.0	19.0		20.2
13	14	15	16	17	18	
Al	Si	P	S	Cl	Ar	
27.0	28.0	31.0	32.1	35.5	39.9	
30	31	32	33	34	35	36
Zn	Ga	Ge	As	Se	Br	Kr
65.4	69.7	72.6	74.9	79.0	79.9	83.8
48	49	50	51	52	53	54
Cd	In	Sn	Sb	Te	I	Xe
112.4	114.8	118.7	121.8	127.6	126.9	131.3
80	81	82	83	84	85	86
Hg	Tl	Pb	Bi	Po	At	Rn
200.6	204.4	207.2	209.0	(210)	(210)	(222)
65	66	67	68	69	70	71
Tb	Dy	Ho	Er	Tm	Yb	Lu
158.9	162.5	164.9	167.3	168.9	173.0	175.0
97	98	99	100	101	102	103
Bk	Cf	Es	Fm	Md	No	Lw
(249)	(251)	(254)	(253)	(256)	(254)	(257)

Description of Courses



ACCOUNTANCY

PROFESSOR JAMES THOMAS THOMPSON, *Chairman*
Room 103, The College of Business Administrative Building

In the Department of Accountancy, qualified students may work toward the M.S. and M.B.A. degrees.

A. Prerequisites for M.B.A. and M.S. in accountancy:

In addition to Core I prerequisites, summarized on page 43, students should have successfully completed or complete Accounting 3110 and 3120, Intermediate Accounting I and II; Accounting 3310, Cost Accounting I; and Accounting 4510, Federal Income Tax I.

B. Each candidate for an M.S. Degree in Accountancy must complete a minimum of 33 semester hours and pass a written and/or oral examination. The 33 graduate credits comprising the M.S. in Accountancy include a minimum of 21 hours in the major. Accounting 7110, Accounting Theory I, Accounting 7120, Current Literature in Accounting, Accounting 7830, Techniques in Solving Accounting Problems, and Accounting 7010, Cases and Problems in Decision Making, are required in the major area. The remaining 12 hours are in a collateral area approved by the student's adviser.

At least 24 of the 33 credit hours required must be in courses designated primarily for graduate students (7000 level or above).

6220. Consolidated Financial Statements. (3).

Consolidations, mergers, foreign exchange. Spring semester. PREREQUISITE: Accounting 4210.

6251. Readings in Auditing. (3).

Auditing theory, standards and procedures, case studies applicable to specific industries, current trends, study of American Institute of Certified Public Accountants releases pertaining to auditing. Spring semester. PREREQUISITE: Accounting 4240.

6520. Federal Income Tax II. (3).

Laws and regulations for corporations, estates, and fiduciaries. Spring semester. PREREQUISITE: Accounting 4510.

6540. Governmental Accounting. (3).

Accounting theory and practice applicable to federal, state, and local government; and to nonprofit institutions; budgetary control; classifications, control, and use of funds; financial statements and reports. Fall semester. PREREQUISITE: Acct. 3120.

7010. Cases and Problems in Decision Making. (3).

Accounting analysis for decision making utilizing a case approach; budgeting; cost analysis, administrative accounting. Fall semester. PREREQUISITE: Accounting 2020, 3010 or 3310, or consent of department chairman.

7020. Accounting Applications of Electronic Data Processing. (3).

Planning and operation of electronic data processing systems in accounting; application of quantitative techniques to administrative decision making using accounting data generated by the computer; flow charting of financial and cost data movement; single and integrated electronic data processing systems in accounting. PREREQUISITE: Accounting 3120, Management 3750 or consent of department chairman.

7110. Accounting Theory I. (3).

A study of the broad aspects and objectives of accounting with emphasis on generally accepted accounting principles, modern accounting trends, and contemporary controversial topics, through a study of the current releases of the American Institute of Certified Public Accountants, the American Accounting Association, and other research related to changing accounting concepts. PREREQUISITE: Accounting 3120, 3310 or permission of the instructor.

7120. Current Literature in Accounting. (3).

A further study of the development of accounting theory and the influence of professional accounting societies and regulatory agencies upon the accounting profession. PREREQUISITE: Accounting 3120, 3310.

7240. Cases in Auditing. (3).

Review and refinement of generally accepted auditing standards, procedures and extension of auditing procedures; preparation of long form audit reports and study of special investigations; study of auditing research bulletins of the American Institute of Certified Public Accountants, and pronouncements of the S. E. C. and other regulatory agencies. PREREQUISITE: Accounting 3120, 3310, and 4240.

7310. Standard and Direct Costing. (3).

Budgets, determination of standards, variances and their functions, cost reports, profit projecting, direct costing, gross profit and break-even analysis, cost-profit-volume analysis, capital expenditure control, comparative cost analysis. PREREQUISITE: Accounting 3310.

7510. Advanced Taxation. (3).

Selected research and study in the taxation of individuals and business organizations by Federal and state governments; preparation of selected state and Federal tax returns including those associated with income, excise, gift, death, sales, and payroll; tax practice and procedures. PREREQUISITE: Accounting 4520 or consent of department chairman.

7830. Techniques in Solving Current Accounting Problems. (3).

Review of C.P.A. Examination, including theory of accounts, accounting practice, and auditing. Open to persons with substantial accounting backgrounds, and on permission of instructor. Spring semester. PREREQUISITE: Substantial accounting background and permission of instructor.

7910-7912. Problems in Accounting. (1-3).

Directed independent reading and research projects in an area selected by the student with the approval of the staff member supervising. PREREQUISITE: Consent of the department chairman.

7910. Public Accounting.**7911. Industrial Accounting.****7912. Governmental Accounting.****†7996. Thesis. (3-6).**

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of the Graduate School.

†Grades of S, U, or P will be given.

BIOLOGY

PROFESSOR CARL DEE BROWN, *Chairman*
Room 103, Ellington Hall

In the Department of Biology, graduate students will select either Botany, Invertebrate Zoology, Microbiology, or Vertebrate Zoology as a major area of study. The student will consult with his major advisor as to the program of study including undergraduate deficiencies which must be satisfied. Students should familiarize themselves with general requirements for the Master's degree.

- A. Biology 7000, 7200, 7600, and 7996 are required of all those who major in biology. Attendance in seminar is mandatory during each semester after which 12 hours have been accumulated with credit being earned in Biology 7200 in the penultimate semester of residence and credit for Biology 7600 during the last semester.
- B. Based on the 4 point system, a student must maintain a grade point average of 3.0 with no more than 10% of overall program being C's.
- C. A reading knowledge of one foreign language is required.
- D. Written examination, required of all graduate students; covering subject matter designated by advisory committee, will be administered once each semester and once during the first and second summer term on a date published by the department chairman.
- E. Presentation of research—7600 and a thesis—7996 as approved by the student's major professor.
- F. Final oral examination.

Biology may be used as a collateral area provided the student has the necessary undergraduate prerequisites.

When a student is enrolled in the MASTER OF SCIENCE IN TEACHING program, bonified graduate credit will be given only in those courses which are open to all graduate students.

6030. Cellular Physiology. (4).

A study of the fundamental unit of all living things. The basic activities of cells are investigated—nutrition, adaption, growth and reproduction. PREREQUISITE: Biology 3070.

Two lecture, four laboratory hours per week.

6060. Limnology. (4).

Physical and chemical attributes of lakes, ponds and streams; organisms of fresh water; problems of production; laboratory work emphasizes Tennessee lakes, and practical training in limnological methods and identification of organisms. PREREQUISITE: Biology 1600, and one year of chemistry.

Two lecture, four laboratory hours per week.

6080. Radiation Biology. (3)

Effects of ionizing and excitational radiations upon life processes. PREREQUISITE: Chemistry 3312 or 3412; Physics 1112 or 2112 and Biology 3070.

Two lecture, two laboratory hours per week.

6100. Organic Development. (3).

The consideration of the theoretical and scientific evidences concerning the origin, development, and establishment of the major groups of

living and extinct animals and plants. PREREQUISITE: One year of biology. Recommended for biology majors and general students as well.

***6200. Marine Botany. (4).**

A survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, treating structure, reproduction, distribution, identification and ecology. PREREQUISITE: Ten hours of biology, including introductory botany, or consent of instructor.

6221. Plant Morphology. (4).

Comparative studies of general structure of lower plants, exclusive of bacteria and related forms, through the Bryophytes. PREREQUISITE: Biology 1200 or its equivalent.

Two lecture, four laboratory hours per week.

6222. Plant Morphology. (4).

A continuation of 6221 in which the vascular plants are considered. PREREQUISITE: Biology 1200 or its equivalent.

Two lecture, four laboratory hours per week.

6231. Plant Physiology. (4).

A study of the principles of physiology and their application to the lower plant groups, exclusive of the bacteria and related forms. PREREQUISITE: Permission of the instructor.

Two lecture, four laboratory hours per week.

6232. Plant Physiology. (4).

A study of the principles of physiology and their application to the living organism as a whole, with emphasis on higher plants. PREREQUISITE: Consent of instructor.

Two lecture, four laboratory hours per week.

6240. Plant Taxonomy. (4).

A study of the principles of plant taxonomy. Special attention will be given to the classification of selected vascular plant families. Lectures, laboratory and field trips. PREREQUISITE: Consent of instructor.

6260. Histological Technique. (3).

Method of preparing plant tissues for microscopic study, theories of staining, and preparation of permanent mounts of plant tissues. PREREQUISITE: Biology 1200 or consent of instructor.

One lecture, four laboratory hours per week.

6400. Advanced Microbiology. (4).

Advanced theory and principles of Microbiology with emphasis on morphology and bacterial metabolism. PREREQUISITES: Biology 3500 and one year of introductory biology, one year of inorganic chemistry, with organic chemistry desirable.

Two lecture, four laboratory hours per week.

6440. Pathogenic Bacteriology. (4).

Methods of bacteriological technique, pure culture studies, and classification of bacteria. PREREQUISITE: Biology 3500, one year of introductory biology, one year of inorganic chemistry, with organic chemistry desirable.

Two lecture, four laboratory hours per week.

6460. Sanitary Bacteriology. (4).

A study of micro-organisms in relation to water and sewage; disinfection and disinfectants. PREREQUISITE: Biology 3500 or its equivalent.

Two lecture, four laboratory hours per week.

6560. Microbiology of Foods. (4).

Microorganisms in natural and processed foods; origins, nature and effects on foods, enumeration, and the relation to health. PREREQUISITE: Biology 3500 or the equivalent.

Two lecture, four laboratory hours per week.

***6600. Marine Vertebrate Zoology and Ichthyology. (6).**

A general study of the marine Chordata, including lower groups and the mammals and birds, with most emphasis on the fish. PREREQUISITE: Twelve semester hours of biology.

6604. Ethology. (4).

A study of animal behavior with emphasis on recent developments in the field including history of ethology, learning, releasers, communication, orientation, instinct, biological clocks, and evolution of behavior. PREREQUISITE: Biology 1600 or equivalent.

Two lecture, four laboratory hours per week.

6620. Vertebrate Histology. (4).

Microscopic study of normal tissues and organs of the vertebrate body. PREREQUISITE: Consent of instructor.

Two lecture, four laboratory hours per week.

6630. General Endocrinology. (3).

Anatomy and physiology of the organs of internal secretion; role of hormones in metabolism and development. PREREQUISITE: Biology 3730.

Three lecture-demonstration hours per week.

6640. Field Zoology. (4).

Designed to acquaint the student with a field knowledge of the animals of this locality. Identification, life history, and habitat will be considered. Birds and insects to be omitted. PREREQUISITE: Eight hours of biology including five hours of zoology.

Two lecture, four laboratory hours per week.

6644. Ichthyology. (4).

A study of fishes, with special emphasis upon the kinds which occur in Tennessee; collection, preservation and identification; life histories, management, and economic importance of fishes. PREREQUISITE: Biology 1600.

Two lecture, four laboratory hours per week.

6660. Histological Technique. (3).

A study of the methods of preparing animal tissues for microscopic study; theories of staining and preparation of permanent mounts. Credit not permitted for both 6260 and 6660. PREREQUISITE: Biology 1600 or consent of the instructor.

One lecture, four laboratory hours per week.

6720. Comparative Neurology. (4).

A detailed study of the nervous system of selected animals with emphasis on the vertebrates. PREREQUISITE: Consent of the instructor.

Two lecture, four laboratory hours per week.

6740. Mammalogy. (4).

Classification, distribution, life histories, economic importance, techniques of field study, methods of collection and preservation of mammals. PREREQUISITE: Biology 3620.

Two lecture, four laboratory hours per week.

6744. Herpetology. (4).

Classification, distribution, life histories, techniques of collection and preservation, natural habitats of North American reptiles and Amphibians. PREREQUISITE: Biology 1600 and 3620.

Two lecture, four laboratory hours per week.

6760. Wildlife Management. (4).

Distribution, identification, population analysis, game mapping techniques, and management of wildlife. PREREQUISITE: Biology 3050 and any one of the following: Biology 3600, 4640, 4644, 4740, 4744.

Two lecture, four laboratory hours per week.

***6800. Marine Invertebrate Zoology. (6).**

A general study of the anatomy, life histories, distributions, and phylogenetic relationships of all marine phyla below the chordates for majors in zoology or geology. Laboratory and field work will be included. PREREQUISITE: Twelve semester hours of biology including general biology or zoology.

6840. Invertebrate Zoology. (4).

The invertebrate animals, exclusive of the insects. With special attention given to phylogeny, organology, and taxonomy. PREREQUISITE: Biology 1600 or its equivalent.

Two lecture, four laboratory hours per week.

6940. Aquatic Entomology. (4).

A survey of the orders of insects having aquatic and/or semiaquatic members with primary emphasis on their classification and with secondary emphasis on their biologies, habitats, etc. (A collection is required.) PREREQUISITE: Biology 3900 and 3940 or permission of the instructor.

Two lecture, four laboratory hours per week.

7000. Seminar in Biological Literature. (2).

Sources of literature in the field of biology and experience in the utilization of such sources in biological research. Class reports and term papers required. Required of all students as a prerequisite for writing a thesis.

7030. Cytology. (4).

Detailed studies of the functions and composition of individual cellular components, nuclear-cytoplasmic relationships, chromosomal variations and their genetic expression in plants. PREREQUISITE: Biology 1200 and 1600 or equivalent.

Three lecture, two laboratory hours per week.

7070. Cytogenetics. (3).

A discussion of current theories concerning the nature of the gene and the mechanisms of recombination and mutation. A detailed study of chromosome aberrations and their genetic behavior. PREREQUISITE: Biology 3070.

Two lecture, two laboratory hours per week.

†7091. Special Problems. (4).

Qualified students may be given special problems which they will investigate. The investigations will be pursued under the supervision of a member of the graduate staff and reported in the form of a written paper.

†7092. Research. (2-4).

The student through consultation, reading, and laboratory work will investigate selected topics in some phase of biology. A formal paper giving a review of the literature and the results of the investigation will be required.

†7093. Problems in Zoology. (3-6).

Supervised research on specific problems in marine zoology for graduates. PREREQUISITE: Zoology 6800 or 6600.

7100. Instrumentation. (2).

A consideration of recent developments in biological techniques which may be applied in the study of living organisms.

Two lecture hours per week.

7200. Seminar in Biology. (1).

A consideration of selected topics in the biological sciences in conference with a member of the staff. PREREQUISITE: Consent of the instructor.

Two one-hour conferences per week, hours may be by arrangement if not scheduled.

7222. Advanced Morphology of the Flowering Plants. (4).

Studies in the origin, development, embryology and embryogeny, anatomy and vascularization of organs of flowering plants. Includes comparative studies of micro- and megasporogenesis and micro- and megagametophyte development, pollination and fertilization. Palynology is studies in light of its economic importance from the standpoint of anthropological and health studies. PREREQUISITE: Graduate standing. Biology 1200, 4221-6221 or 4222-6222 or equivalent.

Two lecture, four laboratory hours per week.

7250. Advanced Plant Ecology. (4).

Considerations of plant distribution on a worldwide and a local basis with emphasis on the factors influencing plant distribution and growth. PREREQUISITES: Biology 3050 or equivalent.

Two lecture, four laboratory hours per week.

7330. Intermediary Plant Metabolism. (3).

A detailed study of the metabolism of carbohydrates, fats and nitrogen compounds in higher plants. PREREQUISITE: Permission of instructor.

7331. Photosynthesis. (2).

Lectures and readings on modern theory of photosynthesis. Includes such topics as chloroplast structure and function; chemistry and photo-

chemistry of chlorophyll; influence of external factors on rate of photosynthesis; absorption, fluorescence, and luminescence; energy storage; efficiency; carbon fixation; photosynthesis in cell extracts; phosphorylation. PREREQUISITE: Biology 1200, 6231, 6232, 7330.

7500. Virology. (4).

Introduction to the viruses. Principles of methodology concerning origin, development, classification, and propagation. PREREQUISITE: General bacteriology and organic chemistry.

Three lecture, two laboratory hours per week.

7530. Bacterial Physiology. (4).

A survey of bacterial physiology including growth, nutrition, biosynthesis, and adaptation. PREREQUISITE: Bacteriology 3500, or its equivalent, and at least one year of chemistry.

Three lecture, two laboratory hours per week.

7600. Seminar in Biology. (1).

A consideration of selected topics in the biological sciences, in conference with a member of the staff. PREREQUISITE: Consent of the instructor.

7720. Mammalian Physiology. (5).

Advanced study of the morphological features of a representative mammal. PREREQUISITE: Biology 3620 and permission of instructor.

Two lecture, six laboratory hours per week.

7730. Mammalian Physiology. (5).

A concentrated investigation of the functional activities of a typical mammal. PREREQUISITE: Biology 3730 and Biology 3620.

Two lecture, six laboratory hours per week.

7750. Animal Ecology. (4).

Relationships of animals to their environments with special emphasis upon population dynamics and ecological relationships at the population level. PREREQUISITE: Biology 3050 and 1600.

Two lecture, four laboratory hours per week.

7840. Protozoology. (4).

A survey of the free living and parasitic protozoa with consideration given to structure, taxonomy, habitat, and life history. PREREQUISITE: Five hours of zoology or its equivalent.

Two lecture, four laboratory hours per week.

7844. Advanced Parasitology. (4).

An advanced course in animal parasitology with emphasis on techniques and experimental approaches in parasitology. PREREQUISITE: Permission of instructor.

Two lecture, four laboratory hours per week.

7920. Advanced Insect Morphology. (3).

Comparative studies of selected insect groups. PREREQUISITE: Biology 3920 or the equivalent.

One lecture, four laboratory hours per week.

7930. Advanced Insect Physiology. (3).

A detailed study of the physiology of various organ systems of insects. PREREQUISITE: Biology 3930 or the equivalent.

One lecture, four laboratory hours per week.

7940. Advanced Systematic Entomology. (3).

An advanced course in insect taxonomy. The principles of insect nomenclature with specific emphasis given to procedures. Intensive study is made in particular groups. PREREQUISITE: Biology 3940 or its equivalent.

One lecture, four laboratory hours per week.

7941. Classification of Insect Larvae. (3).

A survey of the holometabolous orders of insects with primary emphasis on the classification of the larval stages of these insects and with secondary emphasis stressing larval habitata, collecting larvae and techniques of rearing larvae. A student collection will be required. PREREQUISITE: Biology 3900 and 3940; 3930 strongly recommended.

One lecture, four laboratory hours per week.

7960. Applied Entomology. (4).

Identification, ecology, and distribution of insect pests in this area. Principles and methods of control will be included. PREREQUISITE: Permission of instructor.

Two lecture, four laboratory hours per week.

†7996. Thesis. (6).

All students majoring in Biology must write a thesis based on research done under the supervision of his major professor.

*These courses are taught at the Gulf Coast Research Lab, Ocean Springs, Mississippi. Memphis State University residence credit is given through affiliation with the laboratory.

†Grades of S, U, or P will be given.

BUSINESS EDUCATION AND OFFICE MANAGEMENT

PROFESSOR RIENZI WILSON JENNINGS, *Chairman*

Room 107, The College of Business Administration Building

In the department of Business Education and Office Management, qualified graduate students may select from a minimum of 21 semester hours to a maximum of 33 semester hours from Area I, Business Education, and Area II, Office Management.

Area I (Minimum of 9 semester hours): Business Education 7610, 7620, 7630, 7640, 7650, 7660, 7680, 7710-15, 7720, 7910 or Distributive Education 7640.

Area II (Minimum of 9 semester hours): Business Education 6400, 6401, 6410, 7530, 6630, 7420.

Special Requirements: Business Education 7670, Seminar in Business Education, is a required course for all majors to be taken during the last half of the master's program. Also, at least 18 hours of the master's program must be at the "7000" level and at least 12 hours on the major must be at the "7000" level.

6400. Punched-Card Methods. (3).

Introductory course in the operation and use of punched-card equipment. Key punching, sorting, tabulation and preparation of reports, card designing and application to problems in the fields of economics, marketing, accounting, personnel, education, and other areas of research. Both semesters.

6401. Punched-Card Applications. (3).

An advanced course in the field of data processing. The course provides study in flow charting systems analysis, card layout, systems design and production work on unit record equipment. Both semesters. **PREREQUISITE:** Punched-Card Methods 4400 and Accounting 2020.

6410. Office Management. (3).

Modern methods used in office organization and management, scientific office management, office reports, office correspondence, calculating and checking, filing, records retention, duplicating, handling the mail, planning procedures, planning for equipment, office machines, automation, planning for office space, physical working conditions and office layout. Fall semester.

6660. Supervised Work Experience for Teachers of Vocational Business Subjects. (3).

Practical experience in relating theory and practice in the business laboratory surrounding the University and the metropolitan area of Memphis. A student enrolled in this course will be unable to take courses other than evening or Saturday courses because the major portion of his time will be devoted to the activities involved in employment in an actual business position. **PREREQUISITE:** Permission of instructor. Summers only.

7420. Problems in Office Management. (3).

(Formerly Office Management II).

Problems in actuating office employees and controlling the work of the office. Topics: Motivating Office Personnel; Job Evaluation; Recruiting and Training Office Employees; Office Supervision; Standards and Standardization; Quantity and Quality Control; Improving Procedures; Simplification; Office Forms; Measuring and Timing Office Work; Office Manuals; Office Costs and Budgets.

7530. Executive Communications. (3).

Methods and techniques of communication are critically examined through the writing of case problems in correspondence with emphasis placed upon principles and correct writing; and in reports with importance placed upon the collection, analysis, organization, and presentation of authentic data. The course is primarily designed for the student who has had no basic study in either business correspondence or business report writing on the undergraduate level.

7610. Principles, History, and Philosophy of Vocational Business Education. (3).

(Formerly Principles and Philosophy of Vocational Education.)

History, principles, philosophy, and objectives of vocational business education. Special emphasis given to curricular problems in office education, contribution and relation to general education and to vocational education.

7620. Organization and Supervision of Vocational Business Education. (3).

(Formerly Administration and Supervision of Vocational Education.)

Survey of office occupations programs with special emphasis on types of curriculums, production laboratories, and cooperative programs. Classroom supervision, physical layout, administration of programs, and utilization of block time.

- 7630. Improvement of Instruction in Secretarial Business Subjects. (3).**
A critical evaluation of content, visual aids, methods and testing in typewriting, shorthand and secretarial and office practice courses.
- 7640. Improvement of Instruction in Bookkeeping and General Business Subjects. (3).**
A critical evaluation of content, visual aids, methods, and testing in bookkeeping and general business subjects.
- 7650. Teaching Office Practice, Office Machines, and Punched-Card Methods in High School. (3).**
A study of content, methods and standards for courses in Office Practice in High Schools with special emphasis on the impact of automated Data Processing in the office.
- 7660. Tests and Measurements in Business Education. (3).**
Study of standardized and published tests in business education; exploration of the new trends in testing; application of sound testing theory and techniques to business education with special emphasis on evaluation of skill development, the establishment of realistic office competencies, and the evolvement of grading standards.
- 7670. Seminar in Business Education. (3).**
The purpose in this course is twofold: (a) to learn the methods and techniques of evaluating significant research studies and other current business education and related literature, and (b) to evaluate the progress that has been achieved in the conclusions of such literature to guide practical school use.
- 7680. Research and Thesis Preparation. (3).**
This course is planned to offer the student practical experience in analyzing and solving typical problems in various fields of business. Emphasis is placed on research techniques, report procedures, and applied presentation. The material is selected and designed to give needed supplementary guidance during thesis writing and/or problem solving in important areas other than content. An individual formal research problem is mandatory when the course is not taken to complete the sequence of one in which definite research and presentation are required.
- 7710-15. Workshop in Business Education. (3).**
A study of some phase of the business education curriculum through the media of group study; participants will have opportunity to work on content, methods, techniques, materials, and evaluative criteria.
- | | |
|--------------------------|---------------------------|
| 7710—Shorthand (3) | 7713—General Business (3) |
| 7711—Typewriting (3) | 7714—Bookkeeping (3) |
| 7712—Office Practice (3) | 7715—Evaluation (3) |
- (Not more than 9 hours of workshop courses in Business Education can be applied toward a Master's Degree.)
- 7720. Guidance in Business Education. (3).**
History, principles, and philosophy of guidance in business education; relationships of business teacher to school guidance services; special attention directed to the development, scope, and responsibilities for vocational guidance with respect to selection and retention of vocational students.
- 7910. Problems in Business Education. (1-6).**
Directed independent research projects in an area selected by the stu-

dent with the approval of the staff member supervising. **PREREQUISITE:** Approval of supervising teacher and departmental chairman.

†7996. **Thesis.** (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School.

†Grades of S, U, or P will be given.

BUSINESS FINANCE, INSURANCE AND REAL ESTATE

PROFESSOR JAMES A. COLLIER, *Chairman*

Room 123, The College of Business Administration Building

In the Department of Business Finance, Insurance, and Real Estate qualified students may work toward the M.S. in Business Finance or the M.B.A. degree in Business Finance, Insurance, or Real Estate.

A. Requirements for the M.B.A. degree are summarized on pages 43-44. The 12 hours of concentration and electives must be approved by the department.

B. Prerequisites for the M.S. in Business Finance.

In addition to Core I prerequisites, students should have completed or complete all necessary prerequisites for the advanced course work.

C. Each candidate for the M.S. degree must complete a minimum of 33 semester hours and pass a written and/or oral examination. The 33 semester hours comprising the M.S. degree include 21 semester hours of approved work in the major (24 if a thesis is written) and 9 to 12 semester hours in a collateral area approved by the student's adviser. At least 24 of the 33 semester hours required must be in courses designated primarily for graduate students (7000 level or above).

6310. Real Estate Law. (3).

This course covers law and legal instruments as applied to real estate. It is designed to serve the needs of property owners and those engaged in the real estate business. **PREREQUISITE:** BFIR 3310.

6320. Real Estate Finance. (3).

Examination and analysis of the sources of funds for financing all kinds of real estate transactions made, including FHA and VA types. **PREREQUISITE:** BFIR 3310.

6340. Real Estate Appraisal. (3).

This course covers the fundamentals of appraising residential, commercial and industrial real estate. **PREREQUISITE:** BFIR 3310.

6610. Corporate Financial Problems. (3).

Advanced treatment of financial management with emphasis on small and medium-sized enterprise and the forces underlying determination of policy. Financial problems are considered in connection with re-funding, reorganization, mergers, and consolidation. **PREREQUISITE:** BFIR 3410.

6810. Property and Casualty Insurance. (3).

The form and functions of fire, marine, automobile, general liability, and other types of property and casualty insurance with emphasis on

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their application to commercial and industrial occupancies. A survey of current underwriting practice. PREREQUISITE: BFIR 3810.

6820. Life and Health Insurance. (3).

The functions of life and health insurance with emphasis upon the need for insurance and the service of life and health insurance to the American family and community. A study of the mechanics of private and public insurance and annuities. PREREQUISITE: BFIR 3810.

6840. Advanced Property and Casualty Insurance. (3).

Company and industry functions other than contracts, including rating, rate-making, reserves, auditing, underwriting, reinsurance, claims, production, engineering, and governmental supervision. PREREQUISITE: BFIR 3810.

7010. Law of Taxation of Estates, Inheritance, and Gifts. (3).

A survey course of the law of taxation as applied to the transmission of property by gift or death and its impact upon accumulations of wealth. The constitutional basis, statutory implementation, administrative regulation, and court interpretation of the laws of the United States and the various states. PREREQUISITE: BFIR 3020.

7020. Law of Taxation of Estates, Inheritances, and Gifts. (3).

Estate planning from an individual viewpoint design to create, maintain, and distribute the maximum estate possible. Consideration is given to the aspects of law, insurance, real estate, investments, and taxes as they relate to the creation of estates of individuals and those who will be engaged in assisting others. PREREQUISITE: BFIR 7010.

7610. Analysis and Control of Business. (3).

An overall study of management problems and the application of scientific management techniques to the control of various phases of business operation. Included are: general management controls, financial management controls, sales management controls, production management controls, and personnel control and appraisal. PREREQUISITE: BFIR 6410 and BFIR 6610.

7910. Problems in Finance and Insurance. (2-4).

Directed independent reading and research projects in finance or insurance areas selected by the student with approval of the staff member supervising. PREREQUISITE: 6 hours of graduate course work in the area selected.

†7996. Thesis. (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School.

†Grades of S, U, or P will be given.

CHEMISTRY

PROFESSOR DONALD W. SCHWARTZ, *Director of Graduate Studies in Chemistry*
Room 308, J. M. Smith Hall

Graduate study in the Department of Chemistry is designed to develop a broad foundation of reasonable depth in chemistry as well as to emphasize original and authoritative research, making use of the most modern techniques and skills. Experience has shown that these goals can best be achieved by a combination of a limited number of formal courses, active participation in the research programs of senior scientists, and involvement in informal discussion

groups as well as formal seminars. Only through a diverse program that meets the needs of the individual student can graduate training prepare students to assume roles of leadership in academic and industrial research, college and junior college teaching, and the interdisciplinary demands of industrial and government laboratories.

Programs for the master's and doctor's degrees in inorganic, analytical, organic, physical and biochemistry are available. Minors may be taken in other departments including physics, mathematics, geology, and engineering and in fields other than the student's major within the Department of Chemistry.

Detailed information on the current research fields of members of the chemistry department faculty is given in a booklet available from the departmental office.

Although teaching experience is not required for a graduate degree, all graduate students are encouraged to experience the responsibility for laboratory supervision. Financial assistance is available to most graduate students in the form of teaching or research assistantships as well as fellowships and traineeships.

Prospective students, in addition to meeting the requirements for admission to The Graduate School, should have completed the fundamental course at the college level in organic and physical chemistry, physics, and mathematics through calculus. Deficiencies in the undergraduate programs of entering students must be corrected before the end of the first year of study. To aid in determining these deficiencies, entering students will be required to take diagnostic examinations in inorganic, analytical, organic, and physical chemistry. The results of these examinations will *not* become part of the student's record but will be used only for planning the student's program. These examinations are usually given during the week prior to registration.

Master's Degree

General master's degree requirements are found on page 46. Departmental requirements consist of the satisfactory completion of 30 hours of graduate credit including:

1. Chemistry core courses (or the equivalent): 7111 (Systematic Inorganic Chemistry), 7311 (Organic Reaction Mechanisms), 7411 (Chemical Thermodynamics); and 7910 (Special Problems in Chemistry).
2. Twelve additional semester hours of graduate credit. Courses taken in areas other than chemistry must be approved by the student's major adviser and the Director of Graduate Studies. Chemistry 7211 (Systematic Analytical Chemistry) is strongly recommended to all students.
3. Participation in seminar during each semester in residence (excluding summer terms) is required. A minimum of two semesters of seminar (one semester hour) is required for a degree and no more than two semester hours of seminar credit may be counted toward the 30 semester hours required for graduation.
4. A thesis (Chemistry 7996) acceptable to the student's committee and the Director of Graduate Studies is required. Up to six semester hours of thesis may be applicable toward the 30 semester hours required for graduation.

Ph.D. Degree (See general regulations of The Graduate School.)

Departmental requirements consist of:

1. Course requirements — Although no set number of course credits is required for the Ph.D., it is expected that a student with a B.S. degree holding a teaching assistantship will usually require two to two and a half years to complete all courses. During the first year, essentially all

the student's time will be consumed with course work, but thereafter an increasing proportion will be devoted to research. All doctoral candidates are required to demonstrate competence in physical, organic, and inorganic chemistry as well as their major areas before being admitted to candidacy status. The student usually prepares for candidacy by enrolling in a core curriculum consisting of Chemistry 7111 (Systematic Inorganic Chemistry), Chemistry 7311 (Organic Reaction Mechanisms), and Chemistry 7411 (Chemical Thermodynamics). In addition, Chemistry 7211 (Systematic Analytical Chemistry) and 7412 (Chemical Kinetics) are recommended. Departmental and area seminar participation is required of all students.

2. *Qualifying Examination:* Usually, the qualifying examination is taken after the student has completed the core courses, Chemistry 7211 and 7412 and nine semester hours in his major area. The written examination will primarily cover material in the major area. However, where a grade of "B" was not obtained in a core course or Chemistry 7211 and 7412, the examination will cover this area in addition to the major.
3. *Foreign Language:* The knowledge of at least one foreign language is required and should be completed as soon as possible after beginning graduate study but not later than the date on which application is made for candidacy. Usually, the language is either Russian or German, although with special permission another language is acceptable. The language requirement may be met by written examination or by having satisfactorily completed two years of college work in the language.
4. *Dissertation and Research Prospectus:* The dissertation must embody the results of an extended research effort which is an original contribution, worthy of publication. It should reflect the candidate's ability to conduct independent investigation and interpret in a logical manner the facts and phenomena revealed by the research. The choice of a problem and a research director is up to the student; however, he should consult with the various staff members in his field of major interest before making a final decision. This should be done toward the end of the first year of graduate study. The student should then prepare a *Research Prospectus* to be given as a preliminary oral presentation of the research problem to representatives of the graduate staff. The *Research Prospectus* is intended not so much as an examination as an opportunity for the student to receive suggestions and to evaluate the significance of his proposed study.
5. *Candidacy.* In order to become a candidate for the Ph.D. degree, a student must have satisfied the departmental requirements concerning the qualifying examinations, the foreign language, and the *Research Prospectus*.
6. *Final Examination.* The final examination on the student's dissertation and related material will be administered after he has completed his dissertation and essentially all of his course work.

6011. Biochemistry. (4).

An elementary course dealing principally with chemistry of carbohydrates, proteins, lipids, vitamins, etc., digestion and absorption, with consideration also given to certain physio-chemical topics including the colloidal state, colligative properties, equilibria and buffer mechanisms, and the electrolyte structure of body fluids. PREREQUISITE: Chemistry 3312.

Two lecture, four laboratory hours per week.

6012. Biochemistry. (4).

The topics include blood and other tissues, the excretions, energy metabolism, intermediary chemical metabolism. PREREQUISITE: Chemistry 4011.

Two lecture, four laboratory hours per week.

6220. Instrumental Analysis. (3).

Applications of recent developments in the field of instrumental analysis. The theory and use of colorimetric, spectrophotometric and electrometric methods of chemical analysis. Experience will be gained in the use of the Beckman DU spectrophotometer and other related colorimetric and spectrometric instruments. PREREQUISITE: Chemistry 4210.

Two lecture, four laboratory hours per week.

6310. Organic Qualitative Analysis. (3).

Characterization of known and identification of unknown organic compounds by solubility tests, class reactions, specific test reagents, and the preparation of derivatives. PREREQUISITE: Chemistry 2200, 3312.

Two lecture, six laboratory hours per week.

7011. Principles of Chemistry. (3).

This course, open only to high school science teachers, covers the fundamental principles of chemistry usually encountered in a general chemistry course, but presented in greater depth. Topics included are: atomic structure, bonding, periodicity, acid-base theory, chemical equilibrium, ionic equilibria and qualitative analysis, oxidation potentials, electro-chemistry and nuclear chemistry. The quantitative aspects of most of these topics are emphasized. This course cannot be applied toward a major or minor in chemistry or physics. PREREQUISITE: One year college chemistry or the permission of the instructor.

Three lecture, three laboratory hours per week.

7012. Principles of Chemistry. (3).

This course, open only to high school science teachers, is a continuation of Chemistry 7011. It includes a review of atomic structure and bonding; an introduction to thermodynamics and chemical kinetics; ionic equilibria in solution; electro-chemistry and oxidation-reduction; and an application of fundamental principles to the systematic study of the chemistries of the elements. Periodicity of structure and its relationship to the properties of the elements will be emphasized. PREREQUISITE: Chemistry 7011 or its equivalent.

7020. Principles of Organic Chemistry. (3).

This course is open to high school science teachers. It is the systematic presentation of the fundamental principles of organic chemistry with interpretation of structure and properties in accord with modern atomic and molecular theory. Emphasis is placed upon the courses and uses of organic compounds in our daily lives. Special topics will be developed that will familiarize the high school teacher with the recent advances in the field and areas suitable for special projects for high school students. Laboratory experiments and demonstrations will be developed and performed which may be adapted for use in high school courses. This course cannot be applied toward a major or minor in chemistry or physics. PREREQUISITE: Two years of college chemistry or Chemistry 7010.

Three lecture, three laboratory hours per week.

7030. Analytical Chemistry. (3).

This course stresses recent analytical methods. It covers the fundamental principles of analytical chemistry including some gravimetric and titrimetric methods but with major emphasis on modern instrumental techniques. These include: ultraviolet, visible and infrared spectrophotometry, potentiometric, conductometric, voltametric and electrolytic methods; and both liquid and gas phase chromatography. **PREREQUISITE:** Two years of college chemistry or Chemistry 7011.

Three lecture hours per week.

7111. Systematic Inorganic Chemistry. (3).

Principles of wave mechanics, the hydrogen atom, electronic structure of the atom, Aufbau Principle, radiochemistry, oxidation—reduction, descriptive chemistry of the elements, and symmetry and point groups.

7112. Structural Inorganic Chemistry. (3).

A study of the physical methods for determining structure, character tables and group theory.

7113. Inorganic Preparations. (1-3).

An introduction to the laboratory techniques used in inorganic synthesis as illustrated by the preparation, purification, and characterization of inorganic compounds.

7114. Inorganic Reactions and Mechanisms. (3).

Crystal and ligand field theories, octahedral complexes, square planar complexes, stereochemistry, and reaction mechanisms.

7211. Systematic Analytical Chemistry. (3).

An exposition of the field of analytical chemistry as a knowledgeable attitude in approaching analysis problems in terms of the major types of methods available. Emphasis is placed on the scope of the major methods and their potentialities and limitations. Method selection in terms of sample size and constitution, and data evaluation in terms of inherent experimental error, are included.

7212. Radiochemical Methods of Analysis. (3).

An introductory course dealing principally with the interactions of radiation with matter, the detection of radiation, and chemical applications of tracers. Other subjects covered are nuclear structure, decay schemes, activation analysis, hot-atom chemistry, the Mossbauer Effect, and nuclear energy.

7213. Spectrochemical Methods of Analysis. (3).

A study of methods of analysis based on interactions of matter with electromagnetic radiation. Included are the methods based on the Beer-Lambert Law, ultra-violet, visible and infrared spectroscopy, as well as mass spectrometry, X-ray diffraction and fluorescence, and electron diffraction. **PREREQUISITE:** Permission of instructor.

7311. Organic Reaction Mechanisms. (3).

An introduction to the mechanistic categorization of the reactions of organic molecules. Consideration is given to the effect of reactant and transition state structure in ionic, radical, and isopolar reaction paths.

7312. Structural Organic Chemistry. (3).

A study at an advanced level of molecular constitution and spatial relationships within molecules. Included are such topics as steric hindrance, conformational analysis, stereochemistry, aromaticity, and chemical

and physical methods of structure determination with emphasis on spectroscopy.

7313. Physical Organic Chemistry. (3).

A detailed consideration of the qualitative and quantitative treatment of structure-reactivity relationships, including the effects of structural and medium variation. The correlation of structural properties and reactivity with variables derived from quantum chemical approximations is assessed. PREREQUISITE: Permission of instructor.

7330. Organic Preparations. (3).

An introduction to the laboratory techniques employed in organic synthesis as illustrated by the preparation, purification, and characterization of organic compounds.

7411. Chemical Thermodynamics. (3).

Energy relationships and properties of ideal and nonideal systems primarily from the standpoint of classical thermodynamics.

7412. Chemical Kinetics. (3).

Theory of homogeneous reactions, theory of absolute rates, homogeneous, and heterogeneous catalysis, and mechanisms of reactions.

7413. Statistical Thermodynamics. (3).

A development of the fundamental principles of statistical thermodynamics and application to chemical systems. PREREQUISITE: Permission of instructor.

7414. Quantum Chemistry. (3).

Discussion of the Schrodinger equation, and its solution in simple cases, application of group theory and theory of molecular bonding. PREREQUISITE: Permission of instructor.

7511. Principles of Biochemistry. (3).

The chemistry of molecules in cellular systems and the major metabolic processes of the cell.

7512. Macromolecular Biochemistry. (3).

A discussion of the biosynthesis and function of proteins and nucleic acids.

7513. Experimental Methods in Biochemistry. (3).

An introduction to modern biochemical laboratory techniques including the isolation and characterization of nucleic acids, enzymes, and metabolites. The application of colorimetry, chromatography, centrifugation, electrophoresis, and radiosotope techniques will be discussed. PREREQUISITE: Permission of instructor.

†7910. Special Problems in Chemistry. (3-12).

Individual investigation and report under the guidance of the student's major adviser.

†7913. Chemistry Seminar. (½).

Formal meetings, presentation, and discussion of current topics of interest. Students, faculty and visiting scientists participate. Required of all regularly enrolled graduate students. (May be repeated for a maximum of 3 credits.)

†7996. Thesis. (6).

An original investigation undertaken with the supervision of a member of the graduate staff. This investigation will furnish the material for the thesis.

†8100. Special Topics in Inorganic Chemistry. (1-3).

Lectures and conferences covering selected areas of current interest in inorganic chemistry (including coordination compounds, ligand field theory, interstitial compounds, metal carbonyls, and physical methods of structure determination. (May be repeated for a maximum of 12 hours). PREREQUISITE: Permission of instructor.

†8200. Special Topics in Analytical Chemistry. (1-3).

Lectures and conferences covering selected areas of current interest in analytical chemistry. Topics include equilibrium and titrimetric methods, electroanalytical methods, spectral methods, separation techniques, microanalysis, statistics and data analysis, radiochemical techniques, and electrode kinetics. (May be repeated for a maximum of 12 hours.) PREREQUISITE: Permission of instructor.

†8300. Special Topics in Organic Chemistry. (1-3).

Lectures and conferences covering selected areas of current interest in organic chemistry (including heterocyclic chemistry, organo-metallic compounds, alkaloids, steroids, terpenes, photochemistry, non-classical systems, biosynthesis, stereochemistry, carbohydrates, new synthetic methods, high polymers, and advanced physical-organic chemistry). (May be repeated for a maximum of 12 hours.) PREREQUISITE: Permission of instructor.

†8400. Special Topics in Physical Chemistry. (1-3).

Lectures and conferences covering selected areas of current interest in physical chemistry (including non-aqueous solutions, surface chemistry, X-ray crystallography, theoretical spectroscopy, nuclear structure, molecular structure of macromolecules, colloid chemistry and electrochemistry). (May be repeated for a maximum of 12 hours.) PREREQUISITE: Permission of instructor.

†8500. Special Topics in Biochemistry. (1-3).

Lectures and conferences covering selected areas of current interest in biochemistry (including enzymology, protein chemistry, physical chemistry of biochemical macromolecules, lipid and carbohydrate metabolism, amino acid metabolism, nucleic acid chemistry, biochemical energetics, and metabolic regulation). (May be repeated for a maximum of 12 hours.) PREREQUISITE: Permission of instructor.

†8913. Chemistry Seminar. (½).

Formal presentations and discussions of current topics of interest. Faculty, graduate students and off-campus scientists participate. Required of all Ph.D. candidates.

†9000. Doctoral Research and Dissertation. (1-10).

An original investigation undertaken with the supervision of a member of the graduate staff. This investigation will be the basis of a doctoral dissertation and a contribution to the chemical literature. (Maximum amount of semester credits is 30.)

PHYSICAL SCIENCE

For the collateral area, 9 or 12 semester hours in courses approved by the Chairman of the department and the student's major professor.

6050. Glass Manipulation. (2).

A laboratory course in the fundamentals of glass manipulation and the construction and repair of simple laboratory apparatus.

Six laboratory hours per week.

6070. Physical Science for High School Teachers. (3).

A study of the fundamental principles of chemistry and physics as they relate to the understanding and teaching of these sciences in high school.

Three lecture hours per week.

6071. Physical Science for High School Teachers. (3).

A study of the fundamental principles of astronomy, meteorology, and geology as they relate to the understanding and teaching of these sciences in high school. PREREQUISITE: Chemistry 6070.

Three lecture hours per week.

6080. Space Science. (3).

This course, open only to high school science teachers, is a basic introductory course in astronautics. It includes a history of astronautics, a description of the solar system, and some astronautical objective in our solar system. It treats the methods of space physics, interplanetary environment, astrogeology and astrobiology. Also included in the field of space engineering are such topics as vehicle development, aerodynamics, guidance and control systems, propulsion systems and structural design. A brief discussion of basic and human factors in space medicine are also presented. PREREQUISITE: One year of general physics.

7010. Teaching Science Through Inquiry. (3).

Primarily a laboratory course designed especially for high school teachers emphasizing the techniques of lecture demonstration and laboratory work which promote an understanding of physical phenomena through the method of inquiry. Selected experiments will be conducted and evaluated in terms of their value to catalyze inquiry and understanding in the minds of high school students.

7040. Astronomy. (3).

A course in astronomy open to junior and senior high school teachers of science.

†Grades of S, U, or P will be given.

DISTRIBUTIVE EDUCATION

PROFESSOR C. EDWIN PEARSON, *Chairman*
Room 401, The College of Education Building

In the department of Distributive Education the prerequisites are: a Bachelor's degree, 9 hours in Marketing, Salesmanship, Sales Promotion, Retailing or Advertising; Distributive Education 4630; verified practical experience in a distributive occupation(s).

Area I (minimum of 9 hours) Distributive Education 6640, 6650, 7993; Management 6210, 6420; Marketing 7010, 7011, 7012, 7013.

Area II (minimum of 9 hours) Distributive Education 6610, 6630, 7610, 7620, 7640, 7650, 7660, 7996, plus one elective (to make a total of 21 hours) selected from Area I, Area II, or from the following: Education 6011, 6303, 7511, 7521; Marketing 7020, 7021, 7022, 7030.

For the collateral area, 9 to 12 semester hours are required as approved by the adviser.

- 6610. Organization and Operation of Distributive Education Programs. (3).**
A study of the background and development of distributive education in the United States; Federal and State legislation; curriculum implementation; establishing evaluating reporting and improving programs.
- 6630. Materials and Methods in Distributive Education. (3).**
The instructional materials and techniques used in high school and post-high school Distributive Education classes.
- 6640. Marketing for Distributive Education Teachers. (3).**
A study of current marketing practices, marketing functions, merchandising, prices and competition. PREREQUISITE: Permission of Distributive Education Department chairman.
- 6650. Retailing Principles for Distributive Education Teachers. (3).**
A study of the organization, functions, and operation of retail businesses with emphasis on training needs and the implications for the distributive education teacher-coordinator. For extension classes only. PREREQUISITE: Permission of the Distributive Education Department Chairman.
- 7610. Principles and Philosophy of Vocational Education. (3).**
The history, philosophy, principles and objectives of vocational education; curriculum problems; contribution of vocational education to general education; research problems and current vocational education literature.
- 7620. Administration and Supervision of Vocational Education. (3).**
Designed for the vocational teacher or public school administrator desiring to accept responsibility for supervising vocational education programs at local, area or state levels. Includes study of program design; curriculum construction; classroom supervision; physical layout; administration of supplies, textbooks and equipment; state and federal legislation; accounting and reporting.
- 7640. Techniques of Coordination in Vocational Education. (3).**
Selecting training agencies; developing job analysis; selecting and briefing the training supervisor; selecting and working with advisory committees; utilizing other community resources.
- 7650. Problems in Distributive Education. (3).**
A study of current trends and problems related to distributive education; viewpoints of leaders in the field; special attention to problems of students enrolled.
- 7660. Organizing and Teaching Adult Distributive Education. (3).**
A study of the techniques of working with trade associations, employment services, Manpower programs, itinerant instructors and the unique features of planning, organizing, promoting, teaching and evaluating balanced continuing education programs for distributive occupations.
- 7670. Distributive Education in the Junior College. (3).**
For teachers and administrators. A study of the objectives, nature and scope of post-secondary distributive education programs. Included will be suggestions for planning, developing, operating and evaluating programs in area vocational schools, technical institutes and junior colleges.

7993. Work Experience in Distribution for Distributive Education Teachers. (1-3).

For graduate students needing recent practical experience in a distributive occupation. Students will be employed in cooperating businesses and assigned duties in sales production and in personnel training. The student will prepare a comprehensive written report of his practices, experience and problems and special investigations. **PREREQUISITE:** Teaching experience.

†7996. Thesis. (3-6).

†Grades of S, U, or P will be given.

ECONOMICS AND FINANCE

PROFESSOR FESTUS JUSTIN VISER, *Chairman*

Room 306, The College of Business Administration Building

In the Department of Economics and Finance, qualified graduate students may work toward the M.A. degree or the M.B.A. degree.

- A. Requirements for the M.B.A. degree are summarized on pages 43-44. The twelve hours of concentration and electives for this degree must be approved by the department.
- B. Requirements for the M.A. degree are a minimum of 21 semester hours of approved course work in economics and/or finance courses. The remaining 9-12 semester hours, with approval, may be taken in collateral areas. At least 24 of the 33 hours required must be in courses designated primarily for graduate students (7000 level or above). A comprehensive examination, written or oral, must be successfully passed. Proficiency in intermediate level theory and in degree course work will be expected.

1. *Economic Theory and Its Development.*

6310. Microeconomic Theory. (3).

An intermediate level approach to price theory. Stress is placed on the market mechanism as a device for resource allocation, with attention given to the uses of basic microeconomic concepts in the analysis of problems and in the formulation of policy. Both semesters.

6320. Macroeconomic Theory. (3).

An intermediate level approach. Attention is given to social income accounting and to functional relationships between important aggregate economic variables, as well as to forecasting and social policy implications. Both semesters.

6410. Early Development of Economic Thought. (3).

A critical study of the earlier origins of economic thought, the emergence of classicism, and the several dissident schools that appeared in the century and a half following the appearance of classicism. Fall semester.

7010. Proseminar in Economics. (3).

A comprehensive and intense review of the key concepts of economics and economic analysis, as preparation for specialized, advanced study graduate. Both semesters. **PREREQUISITE:** Permission of the department chairman.

7310. Advanced Microeconomic Theory. (3).

An advanced, comprehensive consideration of the literature on demand theory, market organization theory, theory of the firm, wage theory, interest theory, profit theory. Emphasis is on the usefulness of the theoretical formulations for analytical, research, and empirical study purposes. Fall semester. PREREQUISITE: Consent of the instructor.

7320. Advanced Macroeconomic Theory. (3).

An advanced, comprehensive consideration of the Keynesian and post-Keynesian literature on consumption function theory, liquidity preference interest theory, marginal efficiency of capital theory, multiplier theory, and social model building theory. Emphasis is on the usefulness of aggregate concepts for analytical, research, and empirical study purposes. Spring semester. PREREQUISITE: Consent of the instructor.

7421. Recent Development of Economic Thought. (3).

An analytical study of the development of economic thought from the time of the appearance of the Marginalist in the latter part of the 19th century to the present time. Marshall, post Marshallian writers, Keynes, and Neo-Keynesian writers receive major attention. Spring semester.

8410. Seminar in Economic Thought. (3).

Individual studies in economic thought are pursued. The student is required to select one of the more recent economic thought systems—Marxism, Neoclassicism, Institutionalism, Keynesianism, Neo-Keynesianism—for intensive study and critical analysis. Spring semester. PREREQUISITE: Consent of the instructor.

2. Economic Methodology.**6810. Introduction to Economic Analysis. (3).**

An introduction to the application of quantitative techniques of analysis to economic problems, including the identification of meaningful relationships, formulating usable quantitative statements about them, and developing relevant analytical methods for dealing with them. Fall semester.

6820. Introduction to Economic Analysis. (3).

A continuation of Economics 6810 with emphasis on the more complex and involved relationships of economic theory. Spring semester.

7140. Business and Economic Research. (3).

A study of basic research techniques and their application to business and economic problems. Attention is given to both primary-source and secondary-source study approaches. A critical evaluation of selected sample studies is made. Spring semester.

7420. Seminar in Current Economic Problems. (3).

A general problem area, current in economics, is selected. Individual studies in this area are then pursued with group analysis, discussion, and evaluation at regular meetings. Emphasis is on research technique. Fall semester. PREREQUISITE: Consent of the instructor.

7430. Topics in Economic Analysis. (3).

An examination of some of the more recently developed techniques of economic analysis—including input—output analysis, linear programming, flow-of-funds analysis, operations research, and econometric analysis. Spring semester. PREREQUISITE: Consent of the instructor.

7810. Econometrics I. (3).

A review of the quantitative methodology necessary for understanding and using econometric models. An introduction to the basic concepts of econometrics, with more simple models conceptualized and computed as a means of illustrating econometric technique. Fall semester. PREREQUISITE: consent of the instructor.

7820. Econometrics II. (3).

An examination of the basic theory of the stochastic variable and its relationship to the econometric model. A study of how the simple model can be expanded to become a useful forecasting and analytical device. Spring semester. PREREQUISITE: Consent of the instructor.

7911. Problems in Economics. (1-6).

Directed independent reading and research in an area selected by the student with the approval of the staff member supervising. PREREQUISITE: Consent of the department chairman.

†7996. Thesis. (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor, and filed with the Dean of The Graduate School. Independent research for the master's degree.

8120. Seminar in Economic Forecasting. (3).

After a careful examination of the literature of general and regional forecasting, the student is required to prepare several comprehensive, specific forecasts. These are presented to and defended before the class. Spring semester. PREREQUISITE: Consent of the instructor.

3. International and Developmental Economics.**6110. Latin American Economic Development. (3).**

A critical examination of the economic organization and of the major problems of representative Latin American countries in the context of growth and development theory. Spring semester.

6340. Comparative Economic Systems. (3).

An analytical study of the theoretical framework underlying major alternative economic systems—capitalism, socialism, communism, fascism—with the U.S., Sweden, the U.K., the U.S.S.R., and Spain used as examples. Attention is also directed to problems and difficulties associated with the integration of systems. Fall semester.

6350. International Economics. (3).

A historical approach to the theory of international trade. Consideration is given to the techniques of control over investment and trade, foreign exchange, balance of payments, and world interdependence. Fall semester.

7350. International Finance. (3).

A study of international capital movements, long term and short term, in terms of shifting trade flows and the changing world conditions that affect them. Attention is directed to the instruments and institutions of international investment as well as to their domestic economic and monetary impact. Spring semester. PREREQUISITE: Consent of the instructor.

7510. Theory of Economic Growth and Development. (3).

A consideration of the economic variables involved in economic growth and of the functional relationships that may be of significance,

from the point of view both of the underdeveloped economy and of the mature society. The more important theoretical growth models—Hicks, Harrod, Domar, Duessenberry, Goodwin, Kaldor, Solow—will be carefully analyzed and evaluated. Fall semester.

4. *Investment Economics.*

6710. Financial Markets. (3).

A survey of the important capital funds markets and the institutions and characteristics peculiar to them. The sources of the demand for funds in each market, and the complex interrelations among the several markets are carefully analyzed. Both semesters.

7710. Seminar in Investment Planning. (3).

A study of the objectives of investment management with the emphasis on investments by individuals rather than by institutions. A study of risks as the principal element involved in making investment decisions; the analysis of particular industries, companies, and securities involved in the selection of portfolio investments. Fall semester. PREREQUISITE: Consent of the instructor.

7720. Seminar in Current Problems in Finance. (3).

A general problem area, current in finance, is selected. Individual studies in this area are then pursued with group analysis, discussion, and evaluation of the regular meetings. Emphasis is on research technique. Spring semester. PREREQUISITE: Consent of the instructor.

7910. Problems in Finance. (1-6).

Directed independent reading and research in an area selected by the student with the approval of the staff member supervising. PREREQUISITE: Consent of the department chairman.

5. *Labor Economics.*

6220. History and Theory of American Labor Movements. (3).

A study of major events and trends in American labor history from colonial times to the present, and of their relevance to evolving labor-management relationships. An analysis of alternative theories of American trade union development. Fall semester.

7220. Seminar in Comparative Labor Movements. (3).

An analysis of the historical, ideological, and institutional background of labor movements representative of West European economies, Soviet bloc economies, and so-called "middle way" economies. Fall semester. PREREQUISITE: Consent of the instructor.

7440. Seminar in Public Policy and Labor Relations. (3).

Research and discussion into public policy issues in labor-management relations. Attention is focused particularly on the evaluation and current status of the institutions, agencies, and techniques of government regulation. Spring semester. PREREQUISITE: Consent of the instructor.

6. *Managerial Economics.*

7110. Managerial Economics. (3).

A study of the economic rationale underlying key management decisions. Managerial problems are identified and examined in the light of relevant economic concepts, and action is determined on the basis of economic logic. Fall semester. PREREQUISITE: Consent of the instructor.

*7. Monetary and Fiscal Policy.***6120. Business Cycles and Forecasting. (3).**

Cyclical Fluctuations examined from the standpoint of definition, theoretical explanation, measurement and quantitative evaluation, secular change implications, and basic forecasting techniques. Both semesters.

6610. Central Banking and Monetary Policy. (3).

A critical examination of the history and economic function of central banks. Analysis of the role of monetary policy in achieving predetermined objectives, with emphasis on the interrelationships of monetary policy, central banking, and the financial markets. Spring semester.

6720. Public Finance. (3).

The theory and practice of government expenditure, revenue, and debt, and the problems of integrating them into meaningful fiscal policy. Alternative forms of taxation are analyzed, especially from the standpoint of economic effects. Fall semester.

6750. State and Local Finance. (3).

A study of fiscal operations at state and local government levels in the United States. Particular attention is given to state and local government tax structures, with special emphasis on property tax assessment and administration. A consideration of the fiscal relations of intergovernmental units, their expenditure patterns, debt policy, budgeting, and financial administration. Spring semester.

7610. Monetary and Fiscal Policy. (3).

A survey of monetary theory and fiscal theory with particular emphasis given to its policy implications. Recent thinking and writing in these areas is carefully examined and evaluated. Fall semester. **PRE-REQUISITE:** Consent of the instructor.

*8. Public Regulation of Industry.***6130. Government Regulation of Business. (3).**

The several approaches to legal and legislative control of business—especially tax laws, commission regulation, and anti-monopoly legislation—are considered in view of the impact of each on industrial operating policy and corporate social responsibility. Both semesters.

*9. Regional and Urban Economics.***6510. Economics of Transportation. (3).**

A study of the development of the American transportation system. Included are analyses of transportation services in relation to rate and rate making and to public aid and regulation. Spring semester.

7501. Location Theory. (3).

An analysis of general problems of the special structure of the economy, especially in terms of the location of industry, of the transportation network, and of resources utilization. Emphasis on a theoretical framework that will be useful in later studies in regional and urban economics and in international trade theory. Spring semester. **PRE-REQUISITE:** Consent of the instructor.

7520. Regional and Urban Developmental Economics. (3).

A study of economic growth with the region as the economic development unit. Basic techniques such as regional social income accounting, regional balance of payments analysis, industry location study, economic base analysis, and regional input-output studies are examined. Spring semester. PREREQUISITE: Economics 6510 or the equivalent.

†Grades of S, U, or P will be given.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

PROFESSOR DEVOY A. RYAN, *Chairman*
Room 409, The College of Education Building

In the department of Educational Administration and Supervision all students majoring in the department who are seeking certification will be required to complete a core of 9 semester hours, as follows: Ed. A. S. 7110, *6400, and Sc. Ed. 7521.

A. Preparation for the superintendency requires the following specialized courses: Ed. A. S. 7120, 7140, 7200, one other course from departmental offerings, and Educ. 7401.

Electives: Six semester hours outside the department of Educational Administration and Supervision and one other course selected from any supporting area.

B. Elementary Administration and Supervision requires the following specialized courses: Ed. A. S. *6110, 7220, two other courses from departmental offerings and Educ. 7111, 7201, and 7401.

Electives: Three semester hours selected from any supporting area.

C. Secondary School Administration and Supervision requires the following specialized courses: Ed. A. S. 7150, 7210, two other courses from departmental course offerings, and Educ., 6112, 7401, and 7531.

Electives: Three semester hours selected from any supporting area.

D. General Educational Administration (not preparatory to certification). Core requirements are Administration, 3 semester hours, Supervision 3 semester hours, and Research 3 semester hours.

Specialized courses (12 semester hours) may be selected from departmental offerings.

Electives: Nine semester hours to be selected outside the Department of Educational Administration and Supervision and three semester hours to be selected from any supporting area.

E. The Specialist in Education. The Specialist in Education degree will offer specialization for the public school superintendency, the elementary principalship, the secondary principalship and other administrative positions. Further information pertaining to the Ed. S. can be secured from the Department of Educational Administration and Supervision.

F. The Doctor of Education. The degree of Doctor of Education will offer emphasis in Educational Administration and Supervision. Further infor-

*Not required if equivalent course taken at the undergraduate level. (Substitutions must be approved by the adviser.)

mation pertaining to the Ed.D. can be secured from the Department of Educational Administration and Supervision.

6110. Elementary School Administration. (3).

A study of the major aims of the elementary school; planning the daily program through the integration of related subjects; learning to keep and interpret various types of records and reports. Considering the importance of proper teacher-parent relationships. Special emphasis on the P. T. A. program in Tennessee.

6400. School and Community Relationships. (3).

The relationship of the school to the community movements and organizations concerned with health and safety, government and civic life, religion, occupations, extension services, children's organizations and clubs, adult education, cultural education, community cooperative movements, etc.; relationships of the community to such school activities as attendance, athletics, lunch, libraries, extracurricular program, home study, records and reports, guidance, etc.

7100. Public School Organization and Administration. (3).

The following will be studied: the administrator and his leadership; his relation to all agents and agencies of the school; types of school organization, administrative and instructional supervision; classification and promotion of pupils; curriculum activities and materials; public relations; office administration, plant operation, assemblies, extra-instructional activities; special classes, library, and health program.

7120. School Finance. (3).

The theory and practice of financing public education in the United States, development of guiding principles of educational finance, trends and needs in state and federal participation in school support, and local operational finance; particular attention to the financing of the public schools of Tennessee.

7130. School Business Administration. (3).

The role of business administration in public education; principles and practices of auditing, budget preparation and control, debt service, insurance, legal aspects, payroll administration, purchasing, supply management and transportation.

7140. School Plant. (3).

A consideration of the school plant, grounds, and major equipment in relation to the educational needs of the community; factors in site selection, procedures in planning school buildings, principles of design and construction, architectural and contractual services and maintenance.

7150. High School Administration. (3).

This course is offered as a concise description of modern useful practices in organizing and administering secondary schools, types of high schools, selection and assignment of staff, program of studies, records, management of buildings and grounds, pupil personnel guidance, selection, retention and improvement of teachers, and interpreting the school to the public.

7160. Administration of School Personnel. (3).

This course is designed to deal with the various aspects of school personnel management. Qualification, selection, pay schedules, and general personnel policies dealing with retirement, sick leave, insurance, and

other such problems will be considered. Attention will be given to the efficient use of administrative, instructional and non-instructional personnel.

7170. Internship in School Administration. (3).

This course is designed to provide practical experience to students of school administration. The student will have opportunity to observe and participate as an administrative intern in selected school systems. The areas of observation and participation will include administration, supervision, school-community relationship, finance, and plant and transportation at secondary and/or elementary levels. (Prospective enrollees should give thirty days notice of intention and secure approval of the chairman of the department.)

7171. Internship in School Administration. (3).

This course is designed to provide practical experience for students of school administration. The student will have opportunity to observe and participate as an administrative intern in selected school systems. The areas of observation and participation will include administration, supervision, school-community relationships, finance, and plant management. (Prospective enrollees should give thirty days notice of intention and secure approval of the chairman of the department.)

7172. Practicum: Administration of Higher Education. (3).

This course is designed to provide practical experience for students interested in administrative positions in higher education. The student will have opportunity to observe and participate as an administrative intern in selected junior colleges. The areas of observation and participation will include administration, records and admissions, student personnel services, plant planning and management, community services, and research. (Prospective enrollees should give thirty days notice of intention and secure approval of the chairman of the department.)

7173. Practicum: Administration of Higher Education. (3).

This course is designed to provide practical experience for students interested in administrative positions in higher education. The student will have opportunity to observe and participate as an administrative intern in selected colleges. The areas of observation and participation will include administration, records and admissions, student personnel services, plant planning and management, community services, and research. (Prospective enrollees should give thirty days notice of intention and secure approval of the chairman of the department.)

7180. School Law. (3).

This course is designed to consider the Federal and State statutes and local regulations which are applicable to the field of education. Emphasis is placed on legal requirements and their implications for public school operation. Court decisions relating to public schools are considered. The course is for administrators and students of administrative procedures.

7200. City and County School Supervision. (3).

A course designed to consider the general supervisory functions and techniques in school systems. The purpose of the course is to help the administrator and supervisor evaluate present programs and practices and from the evaluations plan in-service-training experiences which lead to improved instruction.

7210. High School Supervision. (3).

This course is designed to investigate some of the modern theories, principles and practices of school supervision as they apply to the

practical problems of supervision at the secondary school level. Qualifications, selection and performance of supervisors are considered, along with the functional demands on modern secondary schools.

7220. Elementary School Supervision. (3).

This course deals with significant supervisory problems at the elementary school level. Recent research findings will be used to focus on the problems as they are dealt with through democratic elementary school supervision.

7410. Human Relations in School Administration. (3).

The course will emphasize human relations in successful educational leadership positions. Human relations principles will be applied to the various responsibilities of school leaders, and research findings in this field will be interpreted for successful practices in school administration. Investigation of the practices and concepts of school leadership will be designed to help the student develop a personal philosophy which will be of practical benefit in his position.

7500. Contemporary Issues in Educational Leadership. (3).

Seminar on contemporary issues confronting leaders in American education currently before the profession and the public. The role of the administrator in resolving contemporary issues.

7510. Seminar in Educational Leadership. (1-6).

This course is designed primarily for persons in positions of educational leadership. It will deal with problems and issues deriving from movements and trends in our present day culture. Emphasis will be given to educational leadership arising therefrom.

7700. Special Problems in School and Community Relationships. (1 to 3).

Individual investigations and reports of specific problems.

7710. Special Problems in School Supervision. (1 to 3).

Individual investigations and reports of specific problems.

7720. Special Problems in School Plant and Transportation. (1 to 3).

Individual investigations and reports of specific problems.

7730. Special Problems in School Finance and Business Management. (1 to 3).

7750. Special Problems in School Law. (1 to 3).

Individual investigations and reports of specific problems.

7760. Special Problems in Educational Research. (3).

Individual investigations of public school surveys, with a critical study of current practices, trends, and objectives.

†7996. Thesis. (3-6).

Only students with superior scholarship are permitted to register in this course. The students must present in writing an outline describing the proposed thesis. This outline, when approved by the faculty members under whose direction the thesis is to be written, must be submitted to the Chairman of the Department of Educational Administration and Supervision for his approval. This course will involve writing the thesis and will emphasize the adequate setup of the problem, the collection of the data, their use, and conclusions to be reached.

Application for writing a thesis must be filled out on an approved form, after consultation with the major professor and filed with the Dean of The Graduate School at the time of registration.

†8009. **Educational Specialist Thesis.** (3-6).

(See course 7996 description)

8100. **Theories and Practices of Educational Administration.** (3).

The study will be concerned with the basic theories of the organization and administration of public education; philosophical and historical foundations of theories; historical development of theories in current practices; and exploration of possible future administrative theories. PREREQUISITE: Education 7100 or permission of instructor.

8110. **Studies and Research in School Administration.** (3).

A study of emerging concepts of school administration. The areas to be covered will emphasize research and studies in the elements of administrative behavior, the dynamics of administration, and the administrative process. PREREQUISITE: Permission of instructor.

8120. **Economics of Education.** (3).

The study will consist of the theory and practice of education as an economical factor in American society; local, state, and federal sources of school revenue; and the process of public school expenditure. PREREQUISITE: Education 7120 or permission of instructor.

8140. **Advanced School Plant and Practicum.** (3).

Emphasis will be placed on the work of the district and state director of school plant planning; the preparation of educational specifications; blueprint reading in relation to educational specifications; and current practices and literature in school plant planning. The student will spend time in field trips and field work concerned with effective and efficient school plant planning and construction. PREREQUISITE: Education 7140 or permission of instructor.

8160. **The Administration of Pupil Personnel.** (3).

This course acquaints the student with pupil personnel services including accounting, reporting, classification, attendance, and problems of pupils' adjustment to the school situation. PREREQUISITE: permission of instructor.

8180. **Seminar in School Law.** (3).

A seminar incorporating the body of school law, both statutory and case. Students will be given the opportunity to explore judicial interpretations and legal principles underlying statutes and court decisions. Opportunities will be given to develop these topics so as to reach larger issues of policy in school administration. PREREQUISITE: permission of instructor.

8189. **An Overview of Higher Education.** (3).

This course is an orientation of higher education and will deal in breadth with the facets of higher education vital to an understanding of the field. It is designed to build a professional perspective toward higher education.

8190. **The Organization and Structure of Higher Education.** (3).

Educational policies, functions, and practices in the administration of higher institutions, with emphasis upon the various types of organizational structure and services. PREREQUISITE: permission of instructor.

8191. The Community College. (3).

A survey of the history and philosophy of the community college, its place and function, establishment and control, administration, curriculum, staff, supporting physical plant, student population, guidance, and public relations. PREREQUISITE: permission of the instructor.

8200. The Administration of Instructional Programs and Materials. (3).

Practices and the processes used by administrative and supervisory leaders who plan, organize, and co-ordinate the professional activities of teachers in improving pupil-learning experiences. PREREQUISITE: permission of instructor.

8210. Seminar in Educational Supervision. (3).

The course will involve intensive studies of development and research in the supervision of the several areas of instruction in the public schools. Emphasis will be placed on identifying effective techniques to meet current instruction improvement requirements. PREREQUISITE: permission of instructor.

8300. The School Survey. (3).

The history and development of public school surveys, with a critical study of current practices, trends and objectives. Long-term planning of educational programs is emphasized. Field experience in school surveys will be made available to students taking the course. PREREQUISITE: Education 7300 or permission of instructor.

8400. Administrative Leadership and School Public Relations. (3).

This course is designed to improve executive communications involved in the projection of a desirable school image. Emphasis will be placed on public relations, news media, and school publications. PREREQUISITE: permission of instructor.

8950. Dissertation Seminar. (3).

Designed to provide graduate students an opportunity to develop research studies. Based on research and statistic courses previously completed or in progress, the student will have an opportunity to expand his knowledge and use of research techniques. A dissertation prospectus is submitted for analysis before approval by the student's graduate committee. PREREQUISITE: admission to candidacy and consent.

†9000. Doctoral Dissertation. (3-12).

†Grades of S, U, or P will be given.

ELECTRICAL ENGINEERING

PROFESSOR THOMAS D. SHOCKLEY, *Chairman*

Room 101, Engineering Annex

The Department of Electrical Engineering offers coursework leading to a Master of Science degree. Students may pursue specialized programs in the areas of Automatic Control Systems, Electromagnetic Fields and Antennas, Information and Communications Theory, and Solid State Theory and Devices.

Students who hold the degree Bachelor of Science in Electrical Engineering or an equivalent degree will be admitted to full-time graduate work if their academic record warrants. Students who hold degrees in mathematics

or physics will be admitted to the program if their academic record warrants, but they will be expected to take additional coursework to complete their background in basic electrical engineering.

6202. Energy Conversion II. (4).

Advanced A.C. Machinery; power system analysis with emphasis on the solution of problems involving unbalanced faults on power transmission systems; impedance of machines and transformers. PREREQUISITE: Graduate standing and permission.

Three lecture, three laboratory hours per week.

6212. Electromagnetic Field Theory II. (4).

Plane, cylindrical and spherical waves; high frequency transmission lines; introduction to microwave and antenna theory. PREREQUISITE: Graduate standing and permission.

Three lecture, three laboratory hours per week.

6221. Pulse and Digital Circuits. (4).

Timing, scanning, trigger and pulse circuits; astable, bistable and monostable multivibrators; binary counting circuits. PREREQUISITE: Graduate standing and permission.

Three lecture, three laboratory hours per week.

6231. Communication Theory. (3).

Frequency and time domain. Modulation, random signal theory, autocorrelation, basic information theory, noise, communication systems. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

6241. Physical Electronics. (3).

Fundamental particles: quantum concepts; statistics; crystal structure; thermal, dielectric, magnetic and optical properties of solids; solid state devices. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

6251. Control System Engineering. (4).

General equations of physical linear systems and their transfer functions. Transient analysis and stability of control systems. Bode plots, Nichols plot, Routh-Hurwitz criterion, root locus method, introduction to compensation techniques and systems in state space. PREREQUISITE: Permission.

Three lecture hours, three laboratory hours per week.

7201. Electronic Processes in Solids. (3).

Structure of crystals. Quantum concepts. Statistical distributions and transport phenomena. Conduction in conductors and semiconductors. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7202. Solid State Devices. (3).

Continuation of 7201 with emphasis on the analysis of modern solid state devices such as masers and lasers. PREREQUISITE: Electrical Engineering 7201 or permission.

Three lecture hours per week.

7211. Advanced Electromagnetic Field Theory. (3).

Advanced studies in electromagnetic fields, radiation and propagation of energy, PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7212. Wave Propagation in Plasma. (3).

Propagation of electromagnetic waves in homogeneous and inhomogeneous plasma. Dispersion relations, plasma oscillations and energy transfer. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7213. Radiation and Antenna Theory. (3).

Radiation characteristics of conducting and dielectric configurations. Theoretical analysis of antennas and antenna systems. Engineering applications of antennas and radiating structure. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7221. Microwave Engineering. (3).

Analysis of discontinuities in waveguides and cavities. Microwave networks. Pertubational and variational techniques. Faraday rotation in ferrites. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7222. Microwave Electronics. (3).

Analysis of electron beams and their interaction with traveling waves and backward waves. Introduction to coupled mode analysis and traveling wave devices. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7231. Transistor Circuit Analysis and Design. (3).

Analysis and design of small and large signal transistor amplifiers. Multistage amplifiers. Analysis and design of oscillators. Feedback and stability in amplifier design. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7240. Analysis and Design of Linear Networks. (3).

Analysis of two port networks, ideal response characteristics, synthesis of passive networks, and equivalent circuit representation of active networks. PREREQUISITE: Graduate standing and permission.

Three lecture hours per week.

7241. Network Synthesis. (3).

Introduction to the modern network synthesis techniques. Synthesis using ladder networks, lossy elements and iterative methods. PREREQUISITE: Electrical Engineering 7240 or permission.

Three lecture hours per week.

7251. Random Signals and Noise. (3).

Statistical methods for describing and analyzing random signals and noise. Autocorrelation, cross-correlation and spectral density functions. Optimal linear filter theory. PREREQUISITE: Graduate standing and permission.

7252. Information Theory. (3).

Introduction to entropy and channel capacity, group codes, block codes, cyclic codes. Application of coding techniques to improve system reliability. Error correcting codes. PREREQUISITE: Electrical Engineering 7251 or permission.

7261. Logical Design and Switching Circuits. (3).

Analysis and design of switching circuits; logic, number systems, digital

computer components, synthesis of sequential switching circuits. **PREREQUISITE:** Graduate standing and permission.

7262. Introduction to Finite Automata Theory. (3).

Finite-state sequential machines, neural networks, man-machine systems, pattern recognition, language structures, and probabilistic automata theory. **PREREQUISITE:** Electrical Engineering 7261 or permission.

**7521. Advanced Control System Engineering I. (3).
(Servomechanisms I)**

Cascade and feedback compensation. Analysis and control of nonlinear systems. Introduction to adaptive control systems and optimization techniques. **PREREQUISITE:** Electrical Engineering 6251 or permission.

Three lecture hours per week.

**7522. Advanced Control System Engineering II. (3).
(Servomechanisms II)**

Continuation of 7521. Performance criteria for optimum design, computer usage in optimum design. Adaptive control and learning systems. **PREREQUISITE:** Electrical Engineering 7521 or permission.

Three lecture hours per week.

7991. Projects I. (3).

Independent investigation of a problem selected in consultation with instructor; report required. **PREREQUISITE:** Graduate standing and permission.

Nine laboratory hours per week.

7992. Projects II. (3).

Independent investigation of a problem selected in consultation with instructor; report required. **PREREQUISITE:** Graduate standing and permission.

Nine laboratory hours per week.

†7996. Thesis. (6).

Master's thesis.

†Grades of S, U, and P will be given.

ELEMENTARY AND SECONDARY EDUCATION

PROFESSOR HEBER ELIOT RUMBLE, *Chairman, Secondary Education*
Room 424, The College of Education Building

PROFESSOR JOHN A. PERMENTER, *Acting Chairman, Elementary Education*
Room 404, The College of Education Building

MAJOR AREAS

In the departments of Elementary Education and Secondary Education, students may select from several programs, each of which require a nine semester hour Core consisting of Education 7001, 7521, and 7401. Additional requirements are as follows:

A. Master of Arts in Teaching (for those seeking secondary school certification.

This program is designed for a selected group of students who have not completed an undergraduate teacher preparation program but who have exhibited outstanding academic ability, and who desire to qualify for teaching careers in the secondary school. Courses Required: Education 7121, 7301, 6841, and twelve semester hours in areas of endorsement. Total 36 semester hours.

B. Master of Arts in Teaching (for those who hold secondary school certification).

Courses Required: 6112, 7301, 7511, and fifteen semester hours.

C. Master of Education in Secondary Education (generally for those already certified).

Courses Required: 6112, 7511, 7301, 7100, and twelve semester hours of electives (of which at least three hours must be in the student's endorsement.) If a candidate does not hold a professional certificate, he will be required to complete prerequisite and/or corequisite undergraduate requirements as determined by a committee of the department. Total 33 semester hours.

D. Master of Education in Elementary Education (for those who work in Elementary Education). Students are required to consult with adviser as to the program of study. Candidates for the master's degrees will have taught at least one year before the degree is awarded.

E. Master of Education in Guidance (for elementary teachers).

Courses Required: *6611, 7621, 7631, 7651, 7661, 7681, 7692; electives three semester hours. Total 33 semester hours.

F. Master of Education in Guidance (for secondary teachers).

Courses Required: *6611, 7121, 7631, 7651, 7661, 7681, 7691; electives three semester hours. Total 33 semester hours.

G. Master of Education in Guidance and Counseling for Non-Certificated Personnel.

The degree of Master of Education in Guidance and Counseling for non-certificated personnel is designed for employment counselors, ministers and others outside the field of education who need skills in guidance but for whom such a program is not readily available. Courses required: Education *6611, 7521, 7631, 7651, 7661, 7681, two additional guidance courses, and additional semester hours for a total of 33. Courses not otherwise specified are to be determined by the degree candidate and his adviser to meet individual needs. The Core is not required for this degree.

H. Master of Education in Reading (for those who will have at least one year of successful teaching experience before becoming a candidate for the degree and wish preparation as a reading specialist, a reading clinician or as a classroom teacher with special emphasis in the teaching of reading.)

Courses required: either *6242 or 7243, *6344 or 7344, 7244, 7245; six semester hours additional in Reading Education to be selected with guidance of the adviser in keeping with the professional aims of the student; six semester hours elective. Total 33 semester hours.

I. The Specialist in Education. The Specialist in Education degree will offer specialization in (1) Guidance, (2) Reading, (3) Secondary Education, and (4) Elementary Education. Any area approved for graduate study will be acceptable for related work, so long as it contributes to the program of the student. No area will be acceptable unless it meets with the approval of the candidate's committee. Candidates for the degree will be required to complete Education 7521 and Education 7541. At least nine semester

*Not required if equivalent course taken at the undergraduate level.
(Substitutions must be approved by the adviser.)

hours of 8000-level courses in Education will be required. No more than six hours of 6000-level courses will be accepted.

- J. The Doctor of Education. The degree of Doctor of Education will offer emphasis in (1) Curriculum and Instruction and (2) Personnel Services. Any area approved for graduate study will be acceptable for related work, so long as it contributes to the program of the student. No area will be acceptable unless it meets the approval of the candidate's committee. Candidates for the degree will be required to complete three courses in research and statistics: Education 7521, Education 7541, and either Education 8542 or Education 8521. No 6000-level courses will be accepted.

COLLATERAL AREAS:

In the departments of Elementary Education and Secondary Education, the collateral area consists of 9 semester hours of the CORE courses, or Education 7401 (3) and 6 additional semester hours in the department offering the Collateral area as approved by the Collateral area adviser.

The Core Courses

7001. Foundations of Education. (3).

This course includes a study of the historical, philosophical, and social forces influencing modern American education.

7401. Fundamentals of Curriculum Development. (3).

A study of the fundamental aspects of curriculum development and the basic issues underlying curriculum. Four significant aspects are: educational directions; ordering potential experiences; patterns of curriculum organization; and the determination of principles and procedures by which changes in the curriculum can be made, evaluated and sustained.

7521. Introduction to Educational Research. (3).

(formerly Educational Statistics and Research Methodology)

This course includes the kinds of research: documentary, experimental, case study, descriptive. The student is expected to select a research topic and prepare an appropriate design for it. Functional statistics are included.

HISTORY AND PHILOSOPHY OF EDUCATION

6011. History of Education. (3).

This course traces through European history some of the more important educational problems of modern times as they have been affected by the social and political acts of history, by the contributions of some of the leading educational theorists, and by institutional practices.

6012. History of Education in the United States. (3).

This course aims to trace, describe, and evaluate, in the light of accepted facts, the development and growth of our educational practice, institutions, and theories from the beginning of colonial life to the present time.

6021. Philosophy of Education. (3).

The purpose of this course is to furnish a guide to the philosophical treatment of, and to develop in the student some facility in critical and systematic thinking about, educational problems.

6031. Educational Sociology. (3).

Group behavior in the educational process; sociological factors involved in the interaction of pupils, teachers, administrators, and community.

7001. Foundations of Education. (3).

(See Core Courses).

7011. Educational Thought. (3).

This is a study of the evolution of educational theories and philosophies with particular reference to their impact upon educational developments in the United States.

7031. Social Foundations of Education. (3).

This course is designed to study education as a cultural universal. It emphasizes the mutual influence of social institutions and education as well as the factors involved in the socialization of the student personality.

7041. Comparative Education. (3).

This course is designed to offer a scientific study of education in various cultures by exploring the relationships that exist between a given educational system and the philosophy, history, geography, and technology of the people. This course is planned to give background and meaning to the content and method in the area of the social studies with special emphasis on international understanding.

EDUCATIONAL PSYCHOLOGY**6112. The Psychology of Adolescence. (3).**

A study of the characteristics of the adolescent stage of development that should be taken into account in the planning and teaching of secondary school courses of study, in the supervision of extra-class activities in the secondary school, and in guiding and counseling with adolescents.

6131. Mental Hygiene and the School. (3).

Guidance for the teacher in working on her own personality development and a study of the mental hygiene of the child as affected by his total environment, past and present.

7111. Advanced Child Study. (3).

The interrelatedness of all phases of growth as it affects the elementary school child in the home, school, and society.

7121. Educational Psychology. (3).

This is an advanced course in the psychology of teaching and learning designed especially for experienced teachers and administrators who desire to pursue graduate study in the field of education.

8121. Seminar in Problems of Classroom Learning. (3).

A course designed for the advanced graduate student in Education who is particularly interested in investigating problems of classroom learning, with special attention directed to the application of learning theories to classroom procedures. PREREQUISITE: Education 7111, 7121, 7521.

READING**6242. The Teaching of Developmental Reading. (3).**

(Formerly Improving the Teaching of Reading)

Survey of reading methods and research for the person who has had experience in the classroom.

6344. The Teaching of Reading in the Secondary Schools. (3).

A course designed for teachers at the secondary level, either in the content areas or specialists, exploring methods, materials, and organizational patterns by which reading skills can be developed in the secondary schools.

6751. Workshop in the Reading Program. (3-6).

Through the media of group study, discussion, demonstrations, directed observation, and laboratory work, participants will have opportunity to formulate plans for their reading program as to content, methods and techniques, materials, and evaluative criteria.

7242. Advancing the Teaching of Language Arts. (3).

Designed to provide experienced teachers and advanced degree candidates with knowledge of current thinking and research in teaching language as communication, with special emphasis on speaking, listening, and writing. Modern media, linguistics, and the influence of socio-economic factors on language will be considered.

7243. Modern Reading Instruction. (3).

A survey of developmental reading, analyzing the total process in depth: the psychological foundations, the application of learning theory to reading instruction, new approaches, media and the critical evaluation of materials. PREREQUISITE: Teaching experience.

7244. The Diagnosis of Reading Problems. (3).

(formerly 7246, Diagnostic and Remedial Reading in Elementary and Secondary Schools)

An introduction into the identification of problems of pupils who have reading difficulties, including the psychological bases for reading retardation, and the diagnostic procedures used to determine the type and extent of reading disability. PREREQUISITE: Teaching experience and Education 6242 or 7243.

7245. The Treatment of Reading Problems. (3).

Designed to provide knowledge of materials, programs and techniques to be used in classroom treatment to aid pupils in overcoming reading disability; including experience in teaching small groups who need such help. PREREQUISITE: Education 7244.

7246. Teaching Reading to Exceptional Children. (3).

Identification of exceptional children, investigation of problems related to the education of such children, either slow learning or gifted, and the exploration of methods, techniques and materials for effective reading instruction.

7247. Teaching Reading for and Through the Subject Areas (Primarily Elementary). (3).

A course to give a teacher of any subject at elementary or secondary level knowledge of reading skills necessary for most efficient study in that field, and to show how reading instruction may be concomitant with learning of the content of any discipline. Classroom diagnosis of pupils' reading skills and development of materials are aspects of the course. (Credit in this course may not apply toward a degree if the student has credit in 4344 or 6344.)

7442. Curriculum and Supervision in Reading. (3).

A study of selected curricula and the planning of a sound school program in reading; understanding the functions and duties of the

reading supervisor or consultant and the effective ways of implementation. PREREQUISITES: Education 6242 (or 7243), 7244, and 7245.

7843. Supervised Practicum in Reading Program. (3).

A supervised application of the principles and methods of instruction and reading curriculum planning as they apply to practical situations which a reading supervisor or special reading teacher might encounter.

8533. Seminar in Reading Research, I. (3).

Investigation of research related to reading instruction with emphasis on individual study and group analysis. The purpose is to study significant research in order to learn methods and techniques and to evaluate findings in terms of advancing reading education. PREREQUISITE: Education 7245.

8534. Seminar in Reading Research, II. (3).

Designed to further the student's understanding of research as it relates to reading leading to the formulation of a pilot study in reading research. PREREQUISITE: Education 8533.

8841. Reading Clinic I. (3).

8842. Reading Clinic II. (3).

The first semester is devoted to a laboratory experience designed to acquaint the student with clinical procedures used in evaluating reading disability. It includes observation, practice under supervision in the administration of reading clinical instruments and the interpretation of the results. PREREQUISITES: Education 7244 and 7245.

The second semester is a laboratory experience designed to provide the theoretical and practical experience gained by using special techniques and materials for teaching reading to the severely disabled reader.

ELEMENTARY EDUCATION (K-8)

6245. The Teaching of Children's Literature in the Elementary School. (3).

This is a course designed to improve the methods of teaching children's literature in the elementary school. Units on story telling, dramatization, choral speech work, and the correlation of literature with the content subjects will be carried out.

6252. The Teaching of Modern Mathematics in the Elementary School (Grades 1-8). (3).

This is an advanced course acquainting prospective and experienced teachers with the mathematical process required of the elementary child and giving an insight into reasons why certain methods are used.

6262. The Teaching of Natural Science in the Elementary School. (3).

Current developments in elementary science education in both process and content. Examination of new curriculum materials and involvement in learning experiences appropriate for elementary school. Designed primarily for in-service teachers.

6301. Audio-Visual Instructional Materials in Education. (3).

Introduction to means for effective preparation and utilization of selected multi-media materials. Laboratory practice in operation of audio-visual equipment and development of selected materials and techniques centered around student interests. Emphasis on the implications of audio-visual media for teaching.

6701. Workshop in the Improvement of Instruction. (3).

This course is designed primarily to assist in-service and prospective teachers of grades one through twelve to improve the instruction-learning program. Attention is given to common elements of basic methodology such as purposes of education, classroom learning, motivation of learning, the utilization of appropriate materials and resources, evaluation of teaching and learning, etc. Attention is also given to ways and means of applying these elements of methodology in the several instructional areas of the elementary school and in the particular subject areas of the secondary school.

6721. Workshop for Teachers in the Elementary School. (3).

A course designed to meet the needs of in-service teachers by offering an opportunity to work cooperatively on problems which are real to teaching situations and which meet the needs of the individual. **PREREQUISITE:** Teaching experience and consent of the director of the workshop.

6761. Aerospace Education in Schools. (3).

The purpose of this course is to provide teachers with aerospace knowledge and experiences and ways of utilizing this knowledge and experience in the classroom.

6811. Supervised Practicum in the Kindergarten. (3-6).

(formerly Directed Student Teaching in the Kindergarten)

Observation of the growth and development of pupils and methods of teaching; participation in school activities, culminating in assuming responsibility for teaching entire groups.

6821. Supervised Practicum in the Elementary School. (3-9).

(formerly Directed Student Teaching in the Elementary School)

Observation of the growth and development of pupils and of methods of teaching; participation in school activities, culminating in assuming responsibility for teaching entire groups.

6822. Supervised Practicum in the Elementary School. (3-6).

(formerly Directed Student Teaching in the Elementary School)

For the student who has completed six semester hours or less of student teaching in the elementary school and desires some additional experience.

7112. Parent-Teacher-Child Relationships. (3).

This course is designed to develop insight into the parent-teacher, parent-child, and child-teacher relationships, to explore ways of working with parents, and to develop techniques for reporting children's progress to parents of nursery, kindergarten, and primary children. **PREREQUISITE:** Elementary Education 7111.

7201. Trends in Elementary Education. (3).

Trends in classroom organizations and procedures. Innovations, approaches and directions applicable to the improvement of instruction are considered.

7211. Values and Principles of Early Childhood Education. (3).

This course is designed to study current curricula, trends and issues related to kindergarten through the primary grades. Emphasis will be placed on the principles and values of early childhood education; current research; selection, organization, evaluation of learning experiences.

7253. The Teaching of Intuitive Geometry in the Elementary School (Grades 1-8). (3).

Teaching of intuitive geometry as it occurs in the elementary grades. Because of the increased recognition geometry is receiving, this course provides the elementary teacher with a wide variety of activities useful with elementary children.

7272. Current Curriculum Development in Social Science Education. (3).

Emphasis on current developments which are consistent with the needs, interests, and social problems which elementary school children face today. Each student is expected to be familiar with research, new programs and issues related to social science education.

7411. Curriculum Development and Techniques of Teaching Nursery, Kindergarten, and Primary Children. (3).

This course is designed to investigate innovative curricula, methods, and techniques for teaching nursery, kindergarten, and primary children. The subject matter areas studied are mathematics, science, social studies, music, art, and language arts.

7701. Workshop in Family Finance Education. (1-6).

This course is designed to assist teachers in using materials, information and techniques for improving instruction in family finance through units in regular classes. PREREQUISITE: Permission of instructor.

7991. Special Problems in Instruction. (1-3).

Individual investigation and report in the area of classroom instruction under the direction of a faculty member.

8201. Survey of Research in Elementary Education. (3).

A survey, evaluation and possible applications of research concerning theory and practice in the elementary school.

8202. Seminar in Elementary Education. (3).

Basic concepts and programs in elementary education with special emphasis on current literature in the field.

8421. Elementary School Education. (3).

An appraisal of modern curriculum practices, including emphasis on underlying philosophies, as they affect the child, his potential, and his growth.

ADULT EDUCATION

7080. Basic Principles of Adult Education. (3).

This course will provide an overview of the field of adult education. Emphasis will be given to philosophy, objectives, and nature of adult education, its problems and possible solutions. Further emphasis will be placed on historical development, program planning, methods and techniques, the nature of the adult learner, and financing.

7081. Materials, Methods, and Techniques in Adult Education. (3).

After examining the characteristics unique to the undereducated adult, emphasis will be placed on criteria for evaluating educational materials available for this segment of society. This will be followed by an analysis of the methods and techniques available for working with adults and their applicability under varying circumstances.

7082. Programming in Adult Education. (3).

Emphasis will be given to understanding the theoretical foundations

upon which the programming process is predicted, developing a theoretical model, and acquiring the conceptual tools necessary for analyzing the programming process in any adult education organization.

7095. Special Problems in Adult Education. (3).

This will enable students to pursue individual interests and needs under the direction and guidance of the faculty.

SECONDARY EDUCATION

6301. Audio-Visual Instructional Materials in Education. (3).
(See K-8).

6341. Teaching Literature in the Secondary Schools. (3).

Curricular materials, methods of organization, and approaches to the study of secondary school literature, with attention to problems of teaching prose fiction and nonfiction, drama, and poetry.

6701. Workshop in the Improvement of Instruction. (3).

(See K-8).

6741. Materials and Methods of Teaching High School ———. (3).

A workshop in teaching methods in a specified endorsement area.

6791. Materials and Methods of Teaching High School ———. (3).

An advanced course in a specified endorsement area, partly taught by means of televised instruction.

6841. Supervised Practicum in the Secondary School. (3-9).

(formerly Directed Student Teaching in the Secondary School)

Observation of the growth and development of pupils and of methods of teaching; participation in school activities, culminating in assuming responsibility for teaching entire groups.

6842. Supervised Practicum in the Secondary School. (3-6).

(formerly Directed Student Teaching in the Secondary School)

For the student who has completed six semester hours or less of student teaching on the secondary level and desires some additional experience.

7301. Modern Methods in Secondary Education. (3).

A consideration of the overall task or function of secondary education and what this means to secondary school teaching. How the secondary school can perform its role most effectively.

7302. Preparation of Inexpensive Instructional Materials. (3).

Design and preparation of a wide variety of readily-available instructional materials. Laboratory practice is provided in applying techniques such as lettering, coloring, and mounting of illustrations and other materials in preparation of both transparent and non-transparent graphics.

7303. Utilization of Audio-Visual Media.

Analysis of communication theory; development of message design in utilization of multi-sensory aids in theoretical and practical environments; projects developed and presented for class analysis; laboratory experience in media equipment; evaluation and selection of media.

7306. Techniques, Activities, and Materials of Adult Education. (3).

This course is designed to place emphasis on advanced techniques,

activities, and materials used in adult education. Emphasis will also be placed on action research as applied to practical adult education programs.

7341. Seminar in the Teaching of High School English. (3).

Includes both curriculum and instruction of high school English; selection of materials and the derivation of procedures for guiding learning in language, composition, and literature. Concentration by individual students upon special problems.

7342. Teaching Language and Composition in the Secondary School. (3).

For teachers of secondary school English, concentration of problems, curricular materials, and teaching procedures in the areas of grammar, and written composition, with emphasis on application of linguistic knowledge.

7371. The Teaching of the Social Studies in the Secondary School. (3).

A study will be made of the needs of secondary-school youth as they relate to the Social Studies and of instructional strategies appropriate thereto.

7391. Teaching in the Community College. (3).

This course is designed to improve the quality of classroom teaching in the community college by broadening and deepening the scope and levels of perceived needs, relationships, contingencies, and relevant competencies. **PREREQUISITE:** Permission of the instructor.

7431. The Modern Junior High School. (3).

Origin and functions of the junior-high-school; prevailing nationwide practices in its educational program; and a description of suggested improved programs and procedures not yet common to the typical school.

7847. Intern Teaching in the Secondary School. (3).

A professional experience in supervised teaching designed for candidates for the degree of Master of Arts in Teaching who are seeking secondary school certification. Intern teaching consists of full-time teaching for two semesters providing nine semester hours of credit with not more than six semester hours during any one semester. **PREREQUISITES:** Education 7001, 7401, 7521, and Education 7121 or 7301, or one course (6000- or 7000- level) in the student's endorsement, approval of the student's adviser, approval of the Coordinator of Student Teaching, and acceptance as an intern by a cooperating school system.

7848. Intern Teaching in the Secondary School. (3).

This is the second semester of intern teaching for the student who has successfully completed Education 7847. **PREREQUISITE:** Education 7847.

8301. Seminar in the Improvement of Instruction in the Secondary School. (3).

Factors bearing upon the improvement of instruction in the secondary school; the evaluation of research and the individual study of fundamental problems in the improvement of instruction in the secondary school. **PREREQUISITE:** Education 7401.

8441. Seminar in Secondary Curriculum Development. (3).

Factors bearing upon the development of a qualitative learning en-

vironment in the secondary school; the evaluation of research and the individual study of fundamental problems in secondary curriculum development. PREREQUISITE: Education 7401.

CURRICULUM AND SUPERVISION

- 6421. Curriculum Problems and Trends in the Elementary School. (3).**
This course deals with general educational objectives and means of achieving them; the role of the various school subjects and their relationships, and with the organization and use of units of work in the core curriculum.
- 6441. Curriculum Problems and Trends in the Secondary School. (3).**
This course is designed to afford some help in the clarification of secondary school educational purposes and in determination of appropriate learning activities. It deals with the functional teaching objectives, ways of attaining these objectives, methods of establishing relationships among the school subjects, developing the core curriculum, and the organization and use of units of work.
- 7151. Administering and Supervising Public School Education Programs. (3).**
(See Special Education).
- 7161. Advanced Theory in Curriculum Development for the Mentally Retarded. (3).**
(See Special Education).
- 7401. Fundamentals of Curriculum Development. (3).**
A study of the fundamental aspects of curriculum development and the basic issues underlying curriculum planning. Four significant aspects are: educational directions; ordering potential experiences; patterns of curriculum organization; and the determination of principles and procedures by which changes in the curriculum can be made, evaluated and sustained.
- 7431. The Modern Junior High School. (3).**
Origin and functions of the junior-high-school; prevailing nationwide practices in its educational program; and a description of suggested improved programs and procedures not yet common to the typical school.
- 7442. Curriculum and Supervision in Reading. (3).**
A study of selected curricula and the planning of a sound school program in reading; understanding the functions and duties of the reading supervisor or consultant and the effective ways of implementation. PREREQUISITES: Education 6242 (or 7243), 7244, and 7245.
- 7451. Curriculum Development in the Community College. (3).**
A course to develop ability to provide a relevant curriculum for the clientele of the community college. Particular attention will be given to the diverse nature of the students and the relationships of the curricular components to each other, as well as to the students. PREREQUISITE: Permission of the instructor.
- 7461. The Pupil Activity Program. (3).**
A study of current philosophy and practice in regard to responsibilities of teachers, supervisors, and administrators for those phases of educational practice which are essential for the educational program, but are not considered as part of general classroom procedure.

- 7531. Seminar in Curriculum Improvement. (3).**
(formerly Research in Curriculum and Instructional Problems)
 An evaluation of investigations and experimental evidence underlying the aims and instructional practices of the various subject-matter fields of the public schools.
- 7801. Supervision of Student Teaching. (3).**
 This course deals with principles and techniques of supervising student teaching. It is designed for supervising teachers, administrators, coordinators of student teaching programs, and college personnel who supervise student teachers.
- 7992. Special Problems in Curriculum. (1-3).**
 Individual investigation and report in the area of curriculum development under the direction of a faculty member.
- 8421. The Elementary School Curriculum. (3).**
(See K-8)
- 8441. Seminar in Secondary Curriculum Development. (3).**
(See Secondary School.)

EVALUATION AND RESEARCH

- 7511. Measurement and Evaluation. (3).**
(formerly Educational Tests and Measurements)
 Consideration of good evaluation practices, the preparation and use of informal objectives and essay-type tests, a study of typical standard tests, and an introduction to elementary statistical procedures. This course is not required of students who have completed a similar course at the undergraduate level.
- 7521. Introduction to Educational Research. (3).**
(formerly Educational statistics and Research Methodology)
 This course includes the kinds of research: documentary experimental, case study, descriptive. The student is expected to select a research topic and prepare an appropriate design for it. Functional statistics are included.
- 7541. Statistical Methods Applied to Education, I. (3).**
 Use and interpretation of statistical methods in education. Instruction in the simpler statistical calculations, such as measures of central tendency, measures of variability, correlation techniques, and procedures in testing statistical hypotheses using educational data. Emphasis is given to the development of the ability to read and interpret statistical data.
- 7991. Special Problems in Instruction. (1-3).**
 Individual investigation and report in the area of classroom instruction under the direction of a faculty member.
- 7992. Special Problems in Curriculum. (1-3).**
 Individual investigation and report in the area of curriculum development under the direction of a faculty member.
- 7993. Special Problems in Guidance. (1-3).**
 Individual investigation and report in the area of guidance under the direction of a faculty member.

7994. Special Problems in Special Education. (1-3).

Individual investigation and report in the area of Special Education under the direction of a faculty member.

†7995. Thesis. (3-6).

Only students with superior scholarship are permitted to register in this course. The student must present in writing an outline describing the proposed thesis. This outline, when approved by the faculty members under whose direction the thesis is to be written, must be submitted to the Chairman of the Department of Educational Administration and Supervision for his approval. This course will involve writing the thesis and will emphasize the adequate setup of the problem, the collection of the data, their use, and conclusions to be reached.

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School at the time of registration.

†8000. Education Specialist Thesis. (3-6).**8521. Advanced Educational Research. (3).**

A study of the major types of statistical designs in educational research. Randomized, randomized block and Latin square designs. Factorial experiments and related topics. An intensive study of both pure and quasi-experimental designs. Emphasis will be placed on designs, methods, and procedures used in studying problems in education. **PREREQUISITES:** Education 7521 and Education 7541.

8542. Statistical Methods Applied to Education, II. (3).

A second course in educational statistics. Tests of statistical inference, chi-square, simple analysis of variance and covariance, non-parametric methods, partial and multiple correlation, introduction to multi-variance analysis, and related topics. Emphasis is given to the assumptions, uses, and limitations of each statistic discussed. **PREREQUISITE:** Education 7541 or consent of the instructor.

8591. Dissertation Seminar. (3).

This seminar is designed to provide opportunity to expand knowledge and use of research and statistical techniques. Before approval of a dissertation prospectus by the student's graduate committee, the prospectus must be submitted for analysis in his seminar. Approval of prospectus by candidate's committee is necessary for credit to be awarded. **PREREQUISITES:** Admission to candidacy and consent.

†9000. Doctoral Dissertation. (3-12).

GUIDANCE AND PERSONNEL SERVICES

6611. Procedures, Administration, and Organization of Guidance Services in Schools. (3).

Historical background and growth of the guidance movement; sociological, psychological, and educational foundations; functions, scope, organization and administration of guidance services; duties and responsibilities of administrators, and specialists in guidance programs.

6771. Workshop in the Administration of Guidance Services. (3).

This course is designed primarily to assist in-service and prospective teachers and administrators in providing more effective guidance services in grades one through twelve. Services to be considered may be grouped as follows: inventory, information, counseling, placement,

and follow-up. Particular attention will be given to planning, organizing, and evaluating these services.

7621. Problems of the Elementary School Child. (3).

An analysis of social, emotional, and educational problems in the development of the elementary school child, with emphasis on guidance approaches for preventing these problems and helping children resolve their conflicts as they occur.

7631. The Group Process as Applied to Guidance. (3).

This course is a study of the group process as applied to the role of teachers and counselors in Guidance. It includes homeroom and group guidance procedures, and the counselor's function in working effectively with students, administrators, and teachers in the school.

7651. Diagnostic Techniques in Guidance. (3).

(formerly Diagnostic Techniques)

Analysis and use of the diagnostic techniques basic to school guidance and counseling. How to select, use, and interpret devices for gathering data about students; how to assemble and interpret data from cumulative records and case histories. PREREQUISITE: a course in measurement and evaluation.

7661. Educational and Occupational Information. (3).

This course is concerned with needs, trends, training facilities, and vocational opportunities. Emphasis will be placed on gathering, interpreting, and using all types of educational, social, occupational, and community information in the guidance program.

7681. Techniques of Counseling. (3).

This course includes a consideration of different schools of thought in counseling; how the school counselor works. Effective procedures for interviewing and counseling students including implications for school social work.

7691. Supervised Practicum in Guidance and Counseling in the Secondary School. (3).

(formerly Supervised Practicum School Guidance and Counseling)

Supervised application of the principles and methods of guidance derived from professional preparation for school counselors: standardized tests, records and personal data, educational and occupational information, personal and group counseling and interview techniques. Minimum: 45-135 clock hours. PREREQUISITE: Consent of instructor.

7692. Supervised Practicum in Guidance and Counseling in the Elementary School. (3).

7993. Special Problems in Guidance. (1-3).

Individual investigation and report in the area of guidance under the direction of a faculty member.

8611. Student Personnel Services in Higher Education. (3).

The course will analyze the activities, functions, relationships and philosophy of the Dean of Students, Dean of Men, Dean of Women, and the Directors of housing, activities, scholarship and loans, admissions and records, health services, and the counseling center.

8621. Guidance for the Student with Special Characteristics. (3).

Characteristics of the culturally deprived, the gifted, and the under-

achieving student will be discussed. The course will emphasize approaches and problems of assisting these students in emotional development and in educational and vocational planning. A project with students in one of the above classifications will be required. **PREREQUISITE:** Fifteen semester hours of course work in guidance and personnel services.

8671. Operation of Guidance and Personnel Services. (3).

This course will consider the problems of the guidance or personnel services staff member who is responsible for administering the program. Attention will be given to the services themselves and to the principles, techniques, planning, organizing, staffing, directing, and budgeting of these services. **PREREQUISITE:** Fifteen semester hours of course work in guidance and personnel services.

8681. Seminar in Counseling and Personnel Services Research. (3).

This course is designed to give the advanced graduate student in guidance and personnel services the opportunity to explore present research and research methodology in areas of current importance and personal interest and to begin to carry out research of his own. **PREREQUISITE:** Fifteen semester hours of course work in guidance and personnel services.

8691. Advanced Practicum in Counseling. (3).

The advanced practicum in counseling is designed to increase the competency of practicing counselors. Course work will consist of critical analysis of actual counseling interviews, including both individual and group sessions. Various methods will be employed for recording and observing counseling sessions, such as audio and/or video tapes and one-way vision screens. Counseling attitudes, techniques, and ethics will be considered. **PREREQUISITE:** Counseling experience and at least twelve (12) semester hours of course work in guidance and counseling.

8693. Supervised Practicum in Student Personnel Services in Higher Education. (3-6).

Supervised experiences in one or more of the following areas: residence halls, activities, admissions, records, organizations, financial aids, and administration. A seminar will be included. **PREREQUISITE:** Twelve semester hours of courses in guidance and personnel services. (Course may be repeated for a maximum of 9 semester hours.)

LIBRARY SERVICE

In Library Science, only a collateral area may be taken. A total of 9 semester hours, as approved by the adviser, are required.

6231. Organization of Materials. (3).

Includes instruction and practice in simplified procedures for acquisition, preparation, organization and circulation of books and related library materials, such as pamphlets, periodicals and audio-visual aids.

6232. Cataloging and Classification. (3).

Introduction to principles underlying the classification of books and simplified techniques of cataloging books and other materials. The abridged Dewey Decimal Classification scheme is used and the use of printed cards is stressed.

6331. School Library Administration. (3).

The library is treated as a service agency in this course. Emphasis is given to the place of the library in the instructional and guidance

program of the school and to the philosophy and purposes of libraries and librarianship. Included are such problems as standards and evaluation, public relations and publicity, support, housing and equipment, training of assistants and library study hall relationships. Field trips are made to different types of libraries.

†Grades of S, U, or P will be given.

ENGINEERING AND APPLIED SCIENCE

PROFESSOR SILVIO J. SPIGOLON, *Chairman*

Room 215, The College of Education Building

In the division of Engineering, graduate students will consult their assigned advisers as to a program of study for the degree of Master of Science in either civil engineering or mechanical engineering. To be eligible to enroll, the student must hold a degree in Engineering from an accredited institution, or meet the alternate requirements. The alternate plan requires a baccalaureate degree with emphasis in mathematics, physical science, and applied science. Such students should expect to be required to complete a number of undergraduate prerequisite courses in addition to their graduate programs.

The Departmental Chairman or the major professor will provide detailed information upon request.

Engineering may be used as a collateral area provided the student has the necessary undergraduate prerequisites.

7001. Engineering Analysis I. (3).

Review of mathematical methods for application to civil, electrical, and mechanical engineering; introduction to analog and digital computers.

Three lecture hours per week.

7002. Engineering Analysis II. (3).

Analysis of unsteady-state systems; lumped systems for digital computation; distributed systems for analog computation. PREREQUISITE: 7001.

Three lecture hours per week.

7011. Statistical Methods in Engineering. (3).

Basic statistical theory, significance tests, sampling theory and correlation analysis applied to problems in engineering and science.

Three lecture hours per week.

7012. Probabilistic Methods in Engineering. (3).

Uses of information Theory; Symbolic Logic, Bayes Theorem, Principle of Maximum Entropy, applied to problems in reliability, decision theory and engineering design with limited data. PREREQUISITE: 7011 or equivalent.

Three lecture hours per week.

DIVISION OF CIVIL ENGINEERING

6151. Soil Mechanics. (3).

Physico-chemical basis of soil structure; identification and classification; permeability; compressibility; strength; applications.

6152. **Applied Soil Mechanics. (3).**
Applications of theory to practical design of building foundations; retaining walls, hydraulic structures and machine foundations.
6161. **Transportation Systems Engineering. (3).**
Development and function of transportation systems; operational control and characteristics; system coordination; traffic flow and patterns.
7101. **Advanced Mechanics of Materials. (3).**
Unsymmetrical bending and torsion of flexural members of non-circular cross-section, beams on elastic foundations and other selected topics, deformation beyond the elastic limit, theories of failure.
Three lecture hours per week.
7102. **Theory of Continuous Media. (3).**
Analysis of stress and deformation at a point; derivation of the fundamental equations in Cartesian tensor notation by application of the basic laws of conservation of mass, energy, and momentum in mechanics and thermodynamics. PREREQUISITE: Consent of instructor.
7103. **Experimental Stress Analysis. (3).**
Application of electric resistance strain gage, photoelasticity and brittle lacquer techniques to the solution of stress analysis problems.
Two lecture, three laboratory hours per week.
7110. **Advanced Structural Analysis. (3).**
Analytical and energy methods for analysis of statically indeterminate structures. Selected numerical methods and digital computations.
Three lecture hours per week.
7111. **Matrix Analysis of Structures. (3).**
Matrix formulation of force and displacement methods. Code system in the displacement methods. Code system in the displacement method and advanced programming techniques in digital computation.
Three lecture hours per week.
7112. **Structural Dynamics. (3).**
Free vibration of lumped and distributed systems. Normal modes and their use in finding response of structures to transient forces. Digital computation and analog simulation.
Three lecture hours per week.
7113. **Advanced Reinforced Concrete. (3).**
Behavior of reinforced concrete structures; ultimate strength designs. Prestressed concrete structures.
Three lecture hours per week.
7114. **Advanced Steel Design. (3).**
Plastic analysis and design of metal structures; application to multiple-story steel structures.
Three lecture hours per week.
7115. **Plate and Shell Structures. (3).**
Analysis and design of shells of revolution, folded plates and cylindrical shells in reinforced and prestressed concrete.
Three lecture hours per week.

7131. Foundation Engineering. (3).

Critical study of foundation design of completed projects using case records; emphasis on failures and performance records.

Three lecture hours per week.

7132. Advanced Soil Mechanics. (3).

Basic theory and status of current research; applications to foundation problems.

Three lecture hours per week.

7133. Dynamics of Bases and Foundations. (3).

Design of foundations against impact and forced vibrations.

Two lecture, three laboratory hours per week.

7134. Flow Fluids Through Porous Media. (3).

Fluid seepage and underflow problems; filtration; groundwater flow.

Three lecture hours per week.

7991. Projects I. (3).

Independent investigation of a problem selected in consultation with instructor; report required.

Nine laboratory hours.

7992. Projects II. (3).

Independent investigation of a problem selected in consultation with instructor; report required.

Nine laboratory hours.

†7996. Thesis. (6).**DIVISION OF MECHANICAL ENGINEERING****7301. Advanced Mechanics of Materials. (3).**

Unsymmetrical bending and torsion of flexural members of non-circular cross-section, beams on elastic foundations and other selected topics, deformation beyond the elastic limit, theories of failure.

Three lecture hours per week.

7302. Theory of Continuous Media. (3).

Analysis of stress and deformation at a point; derivation of the fundamental equations in Cartesian tensor notation by application of the basic laws of conservation of mass, energy, and momentum in mechanics and thermodynamics. PREREQUISITE: Consent of instructor.

7303. Experimental Stress Analysis. (3).

Application of electric resistance strain gage, photoelasticity and brittle lacquer techniques to the solution of stress analysis problems.

Two lecture, three laboratory hours per week.

7305. Advanced Fluid Flow I. (3).

Basic equations and perfect fluid theory. Mathematical, numerical, graphical and analog methods for solving ideal flow problems. Viscous fluid theory and introduction to boundary layer theory. Unsteady flows, flows in rotating systems, and density-identified flow. Review of mathematical concepts involved in these topics. PREREQUISITE: Mechanical Engineering 3331 or equivalent.

7306. Advanced Fluid Flow II. (3).

Continuation of Mechanical Engineering 7305.

- 7310. Fluid Power Engineering. (3).**
Hydraulic- and air-flow pipes. Pneumatic and hydraulic fluid power-elements and systems. Input-output energy transfer devices.
- 7311. Advanced Topics in Fluid Flow I. (3).**
Subsonic and supersonic compressible flow, shockwaves, and selected topics. PREREQUISITE: Mechanical Engineering 7306 or consent of instructor.
- 7312. Advanced Topics in Fluid Flow II. (3).**
Continuation of Mechanical Engineering 7311.
- 7321. Advanced Heat Transfer. (3).**
Steady and unsteady state. Walls and heat exchanges. Analog computation.
- 7322. Psychrometric Analysis. (3).**
Psychrometrics. Heating, air conditioning, refrigeration.
- 7331. Advanced Thermodynamics I. (3).**
Engineering thermodynamics. PREREQUISITE: Mechanical Engineering 3311 or equivalent.
- 7332. Advanced Thermodynamics II. (3).**
Continuation of 7331. PREREQUISITE: Mechanical Engineering 7331.
- 7341. Space Engineering. (3).**
Jet and rocket propulsion, power, heat transfer, orbits, control.
- 7342. Dimensional Analysis. (3).**
Units, dimensionless numbers. Applications to combustion, fluid dynamics and heat transfer. Similarity and model theory.
- 7351. Nuclear Applications. (3).**
Power generation. Peaceful uses of nuclear energy.
- 7352. Nuclear Defense. (3).**
Effects of nuclear weapons. Civil Defense. Shelter Design.
- 7361. Advanced Materials Science. (4).**
Study of the structure and properties of engineering materials using solid-state physics. PREREQUISITE: Mechanical Engineering 3361 or consent of instructor.
Three lecture, three laboratory hours per week.
- 7365. Corrosion. (3).**
Fundamental causes and mechanisms; corrosion control; study of specific corrosion problems.
Three lecture hours per week.
- 7371. Advanced Mechanical Vibrations. (3).**
Lagrange's and Hamilton's principles in the study of vibrating systems. Methods of solution for the equations of motion will be presented, including digital computer techniques. PREREQUISITE: Mechanical Engineering 4371.
Three lecture hours per week.

7991. Projects I. (3).

Independent investigation of a problem selected in consultation with instructor; report required.

Nine laboratory hours.

7992. Projects II. (3).

Independent investigation of a problem selected in consultation with instructor; report required.

Nine laboratory hours.

†7996. Thesis. (3-6).

†Grades of S, U, or P will be given.

ENGLISH

PROFESSOR WILLIAM OSBORNE, *Chairman*

Room 467, Patterson Hall

In the Department of English, graduate students who select English as a major area will consult their major adviser as to the program of study. The basic requirements are as follows:

Prerequisites: A minimum of 18 hours in upper division English courses, with a minimum grade point average of 2.5 in those courses.

Requirements: A minimum of 18-21 hours in graduate English courses, at least 12 of which must be in courses numbered above 7000. Each student's program must include the following:

- A. Bibliography and Methods of Research (3): English 7801.
- B. Chaucer *or* Studies in Medieval Literature (3): English 6231 or 7211.
- C. Studies in Shakespeare *or* Studies in Renaissance Literature (3): English 7231 or 7212.
- D. The literature of two additional periods of English or American literature (6).
- E. All graduate courses in English (3-6): selection to be made with approval of adviser.

Oral comprehensive examination.

Reading knowledge of one foreign language (French, German, Latin, or Greek), to be demonstrated by (1) 12 hours credit at the minimum grade in each course of C, earned within the last five years prior to entry into Graduate School or by (2) reading examination by date of completion of 9 semester hours of graduate courses in English.

Thesis (3 or 6)—optional.

A 3.0 average in English courses.

For the collateral area, requirements in the Department of English are as follows:

Prerequisites: A minimum of 12 hours in upper division English courses, with a minimum grade point average of 2.5 in those courses.

Requirements: A minimum of 12 hours in graduate English courses, at least 6 of which must be in courses numbered above 7000.

Each student in English must complete at least
 3 hours in English literature before 1800 and at least
 3 hours in English literature after 1800.

A 3.0 average in English courses.

6231. **Chaucer. (3).**
A study of Chaucer's growth as a literary artist, including a chronological reading of representative works and discussion of their philosophical and social context.
6234. **Milton. (3).**
A study of Milton's development as a literary artist, with emphasis on his poetry but with some attention to his prose.
6241. **The English Novel. (3).**
Reading of major English novels from the Renaissance to the mid-nineteenth century related to study of the origin and development of the genre.
6242. **The English Novel. (3).**
A study of major English novels from the mid-nineteenth century to the present, with attention to developments in the genre.
6251. **English Drama. (3).**
A study of the development of the genre in England from medieval times to 1642.
6252. **English Drama. (3).**
A study of English drama from 1660 to the present, with attention to developments in the genre.
6351. **American Drama. (3).**
The development of American drama as a literary form studied in relation to the English and European tradition and to currents in American thought.
6501. **History of the English Language. (3).**
Study of the relationship of English to other Indo-European languages; of etymology and the effects of word-borrowing, word-formation, and semantic change on English vocabulary; and of the development of English sounds, inflections, and syntax.
7001. **Language and Composition. (3).**
This course, open only to high school English teachers, deals with linguistic principles and their application to English grammar and composition. There will be a strong emphasis on the writing and analysis of essays. This course cannot be applied toward a major or collateral area in English.
- *7211. **Studies in Medieval Literature. (3).**
- *7212. **Studies in Renaissance Literature. (3).**
- *7213. **Studies in Seventeenth Century Literature. (3).**
- *7214. **Studies in Restoration and Eighteenth Century Literature. (3).**
- *7221. **Studies in the Literature of the Romantic Period. (3).**
- *7222. **Studies in Victorian Literature. (3).**
- *7223. **Studies in Contemporary Literature. (3).**
- *7231. **Studies in Shakespeare. (3).**
- *7321. **Studies in American Literature before 1860. (3).**

***7322. Studies in American Literature since 1860. (3).**

***7501. Studies in English Linguistics. (3).**

*Courses designated *Studies* provide for specialized work in the literature and in the scholarship of periods, figures, and genres. Content and focus of *Studies* courses may vary from semester to semester. Students will be expected to engage in research leading to the production of substantial papers. Ideally they should have had previous work in the material of these courses. They should, in any case, enroll in *Studies* for which they have had some relevant preparation.

7701. Literary Criticism. (3).

The major documents in Western criticism, from Plato to the present.

7801. Bibliography and Methods of Research. (3).

Examination of bibliographical aids for the study of English and American literature, problems involved in various types of research, and study of the presentation and documentation of scholarly writing.

†7996. Thesis. (3-6).

A prospectus for the thesis must be approved by the student's adviser and the departmental chairman before the student registers for this course. Formal application for writing a thesis must be filed with the Dean of the Graduate School at the time of registration. The completed thesis must be approved by at least two readers.

†Grades of S, U, or P will be given.

FOREIGN LANGUAGES

PROFESSOR L. GRANT REESE, *Chairman*
Room 230A, Jones Hall

In the Department of Modern Languages, graduate students who select French, German, or Spanish as a major area will be assigned a major adviser by the department chairman. This adviser is to be consulted in all matters concerning the student's program of study.

Prerequisites: (1) A minimum of 18 upper division semester hours or its equivalent in the language of the major (French, German, or Spanish); (2) a reasonable proficiency in the language of the major, to be determined by the department prior to acceptance of the application to The Graduate School.

Requirements: (1) A minimum of 27 semester hours of course work in the major (18 of which must be numbered above 7000) or the alternative of 18 semester hours of course work in the major (12 of which must be numbered above 7000) plus nine graduate semester hours of an approved collateral area; (2) a reading knowledge of an approved second language (other than English) at the proficiency level of two years of lower division study, to be demonstrated by examination prior to the completion of course work; (3) M.A. candidates in French, German, or Spanish who are not native to English must demonstrate adequate control of English by examination prior to the completion of course work. (4) a comprehensive examination, written and oral, after the completion of all course work; (5) a thesis (3 credit hours), in addition to required course work.

LINGUISTICS

7101. Introduction to Linguistics. (3).

The nature of language and principles of language analysis.

7201. Romance Philology. (3).

An introduction to Vulgar Latin and a study of its development into the modern Romance Languages.

FRENCH

6301. French Phonetics. (3).

The theory and practice of French sounds; especially recommended for teachers of French.

6305. French Stylistics. (3).

Translations of English Prose into French with an emphasis on style.

6431. The Modern French Novel. (3).

The French novel from the Revolution to the twentieth century, treating the movements of Romanticism, Realism, and Naturalism as they are reflected in the works of such authors as Balzac, Stendhal, Flaubert, and Zola.

6432. The Contemporary French Novel. (3).

A general survey of the twentieth-century French novel, treating the works of such authors as Proust, Gide, Mauriac, Malraux, Sartre, Camus, Maurois, and others.

6451. The Modern French Drama. (3).

French drama from 1800 to 1870, including such authors as Hugo, de Vigny, de Musset, Scribe, Augier, and Dumas *fils*.

6452. The Contemporary French Drama. (3).

From Becque and his school, the *Théâtre Libre*, and Rostand to the present, with emphasis on the twentieth-century drama and such playwrights as Pagnol, Claudel, Tristan Bernard, Giraudoux, Anouilh, Montherlant, Camus, Sartre, Cocteau, and others.

6471. Nineteenth-Century Poetry. (3).

French poetry from Chenier through the Parnassians and the Symbolists.

6501. Applied French Linguistics. (3).

The application of modern linguistic theories to learning French.

7301. Advanced Grammar. (3).

Required of all graduate assistants in French and recommended for all French majors.

7401. Old French. (3).

Introductory seminar. Historical grammar and study of the *Chanson de geste*; also the *Lais* of Marie de France and *Aucassin et Nicolette*.

7421. The French Renaissance. (3).

The new world—literary, as seen in the works of Ronsard and the Pleiade; philosophical and political, in those of Rabelais and Montaigne.

7425. Classicism Prior to 1660. (3).

Precept and example before Corneille: Jean de Mairet. The theater of Corneille and the early plays of Molière.

7426. Classicism After 1660. (3).

The impact of Boileau and *l'Art poétique* in crystallizing the classical principles and pattern. Masterpieces of Molière and Racine. Repre-

sentative selections from masters of the other *genres* in this period of French literature.

7431. Romanticism. (3).

The rise and decline of French Romanticism in the novel, poetry, and drama: Rousseau and Bernardin de Saint-Pierre; Chateaubriand and Madame de Staël; Lamartine, Vigny, Hugo, Musset, George Sand, Stendhal.

7481. Realism and Naturalism. (3).

The impact of positivism and scientific methods on French literature. Realism in Balzac, Flaubert, and Dumas *filis*; Naturalism in Zola, les Frères Goncourt, and the naturalistic theatre.

7491. Proseminar in French Literature. (3).

Introduction to research through investigations of limited scope. May be repeated for credit.

7492. Research in French Studies. (1-6).

May be repeated for credit toward the French major up to a maximum of six hours.

7531. The Age of the Enlightenment. (3).

Comprehensive study of literary trends and innovations within the major *genres* as related to liberal ideas underlying the philosophy of Montesquieu, Voltaire, Diderot, Rousseau, and their contemporaries.

†7791. The Teaching of French. (0).

Required of all graduate assistants in French.

†7996. Thesis. (3).

The thesis in French carries three credit hours and must be approved by the candidate's Departmental thesis committee.

GERMAN

6401. Early German Literature. (3).

German literature of the Medieval and Pre-Renaissance Period.

6402. Humanism, Renaissance and Reformation. (3).

From Renaissance through the age of Luther.

6421. The Baroque Period. (3).

Studies in the writings of important authors of the Baroque period.

6441. The Age of Enlightenment and *Sturm und Drang*. (3).

A study of selected works.

6461. Twentieth Century Prose and Poetry. (3).

A study of selected works.

6462. Twentieth Century Drama. (3).

A study of selected works.

6481. The Classical Period. I. (3).

A study of the major writings of Schiller.

6482. The Classical Period. II. (3).

A study of the major writings of Goethe.

- 6501. Applied German Linguistics. (3).**
The application of modern linguistic theories to learning German.
- 7301. Advanced Grammar. (3).**
Required of all graduate assistants in German and recommended for all German majors.
- 7304. Advanced Conversation and Stylistics. (3).**
- 7401. Old High German. (3).**
A specialized study of Old High German grammar and representative extant documents augmented by a comparative study of Older Germanic language, history, and literature.
- 7421. Middle High German. (3).**
Grammar with selected readings.
- 7431. Romanticism. (3).**
German literature of the Early and Late Romantic Eras. Lectures.
- 7451. Goethe's Faust. (3).**
Interpretation of Parts I and II with reference to antecedents, genesis, and relationship to the poet's life and times.
- 7481. The Age of Realism. (3).**
German literature and thought from 1830 through 1880. Lectures with extensive readings.
- 7482. Naturalism, Impressionism, and Expressionism. (3).**
Literary and philosophical movements from 1880 through 1930. Lectures with extensive readings.
- 7491. Proseminar in German Literature. (3).**
Introduction to research through investigations of limited scope. May be repeated for credit.
- 7492. Research in German Studies. (1-6).**
May be repeated for credit toward the German major up to a maximum of six hours.
- 7501. Methods of Research and Critical Interpretation. (3).**
A study of bibliographical materials and methods of literary analysis in the field of German.
- †**7791. The Teaching of German. (0).**
Required of all graduate assistants in German.
- †**7996. Thesis. (3).**
The thesis in German carries three credit hours and must be approved by the candidate's Departmental thesis committee.

SPANISH

- 6301. Spanish Phonetics. (3).**
The theory and practice of Spanish sounds, especially recommended for teachers of Spanish.
- 6421. The Golden Age. (3).**
A study of Spanish lyric poetry and drama up to 1700.

6422. **The Golden Age. (3).**
A study of Spanish prose up to 1700.
6431. **Contemporary Spanish Prose. (3).**
A study of Spanish prose from the Generation of 1898 to the present.
6432. **Contemporary Spanish Poetry and Drama. (3).**
A study of Spanish poetry and drama from the Generation of 1898 to the present.
6501. **Applied Spanish Linguistics. (3).**
The application of modern linguistic theories to learning Spanish.
6561. **Spanish-American Short Story. (3).**
A critical analysis of Spanish-American short stories and their reflections of predominant social and ethical problems.
6562. **Spanish-American Novel. (3).**
A critical study of representative works by such novelists as Fernandez de Lizardi, Blest Gana, Isaacs, and Guiraldes.
6591. **Spanish-American Drama, Poetry, and Essay. (3).**
A critical study of the development of drama, poetry, and the essay in Spanish America.
7301. **Advanced Grammar. (3).**
A thorough and systematic presentation of Spanish grammar with an emphasis on teaching. Required of all graduate assistants in Spanish and recommended for all Spanish majors.
7401. **Old Spanish Language and Literature. (3).**
An introduction to the general characteristics of medieval Spanish dialects and a literary study of medieval Spanish texts.
7421. **The Picaresque Novel. (3).**
Lazarillo de Tormes, *Guzman de Alfarache*, and other novels of the genre in the seventeenth century.
7422. **Eighteenth Century Spanish Literature. (3).**
The nature and background of eighteenth century Spanish literature. The French influence. Typical works of B. J. Feijoo, Luzan, Cadalso, Moratin, Ramon de la Cruz, Padre Isla and others.
7431. **Nineteenth Century Spanish Literature, I. (3).**
Romantic poetry and drama studies in the works of such writers as the Duke of Rivas, Espronceda and José Zorrilla. Post romantic poetry and drama. Bécquer. *Costumbrismo*. The romantic and historical novel.
7432. **Nineteenth Century Spanish Literature, II. (3).**
The regional novel, the realistic novel and the naturalistic novel are studied in the works of such writers as Fernan Caballero, Valera, Perera, Palacio Valdés, Galdos, and Blasco Ibanez. The poetry of Campoamor and Nunez de Arce. The theatre. Orators and historians.
7482. **The Modernist Movement. (3).**
The characteristics and history of the Modernist Movement in Spanish America and in Spain. A study of the leading *modernists*, including Rubén Darío, Nervo, and Lugones, and Rodo. Pre-Modernistas and Post-Modernism.

7491. Proseminar in Spanish Literature. (3).

Introduction to research through investigations of limited scope. May be repeated for credit.

7492. Research in Hispanic Studies. (1-6).

May be repeated for credit toward the Spanish major up to a maximum of six hours.

†7791. The Teaching of Spanish. (0).

Required of all graduate assistants in Spanish.

†7996. Thesis. (3).

The thesis in Spanish carries three credit hours and must be approved by the candidate's Departmental thesis committee.

†Grades of S, U, or P will be given.

GEOGRAPHY

PROFESSOR PAUL HARDEMAN SISCO, *Chairman*
Room 109, Johnson Hall

In the department of Geography, graduate students who select Geography as a major area will consult their major adviser as to the program of study.

All graduate majors in the department of Geography must have credit for Geography 6111, 6121, and 7503 or their equivalents before being admitted to candidacy. In addition, before they receive the Master's Degree, they must complete either 7202 or 7212, 7461, and one of the seminar courses numbered 7603 through 7608. However, not more than two of the seminar courses numbered 7603 through 7608 may be counted toward the master's degree.

Majors will attempt a thesis only with the recommendation of the graduate school faculty in the department.

For the collateral area, nine semester hours as shown below:

- A. M.A. Degree requirements—nine semester hours as approved by the adviser, with a maximum of 3 semester hours in the earth sciences.
- B. M.S. Degree requirements—nine semester hours as approved by the adviser, with a minimum of six semester hours in the earth sciences.

6111. Earth Science I. The Atmosphere. (3).

An analytical study of the physical processes underlying the behavior and responses of the atmosphere and the application of this general body of knowledge to an understanding of the relationship of man to this important element of his environment.

6121. Earth Science II. The Earth. (3).

An analytical study of land forms, their changes and their uses to man.

6122. Earth Science III. The Soil. (3).

An analytical study of soils to include their physical, chemical, and biological qualities, and their classes, uses, and measures of conservation.

6131. Earth Science IV. The Oceans. (3).

An analytical study of the oceans to include their physical, chemical, and biological qualities; their movements, resources, climate influences, and their importance for transportation.

- 6304. Western Europe. (3).**
A geographic analysis of the lands west of the Iron Curtain.
- 6305. The Soviet Realm. (3).**
A regional analysis of Soviet Union and its satellites.
- 6306. Asia South of the Soviet Realm. (3).**
A consideration of the significance of regional differences in Japan, China, and India, and a brief survey of the remaining areas.
- 6314. Geography of Mexico. (3).**
A comprehensive and systematic survey of the geographical regions, resources, and potentialities of Mexico and the significance they have for Mexico in the economic and political affairs of Latin America and the world.
- 6315. Geography of Brazil. (3).**
A comprehensive and systematic survey of the geographic regions, resources, and potentialities of Brazil and the significance they have for Brazil in the economic and political affairs of Latin America and the world.
- 6316. The South. (3).**
A specialized study of selected regions in the South with emphasis on changes and trends in the cultural-physical complex.
- 6317. Tennessee. (3 or 4).**
A comparison of the human-use, political, and physical regions of the state.
- 6431. Urban Geography. (3).**
A study of the allocation of land for urban uses; the adjustments and adaptations to existing physical phenomena; the patterns, functions, and forms of specific urban land areas; and some of the continuous problems of urban development and growth.
- 6432. City Planning. (3).**
The fundamental principles of urban planning, basic elements of a city plan, and the necessity of continuity in planning administration.
- 6433. Urban Renewal. (3).**
Changing urban land uses, first in areas which must improve or rebuild obsolete patterns, functions, and forms; and second in areas with acceptable uses, structures, and institutions which in the interest and welfare of all the people must have additional space for growth and expansion.
- †6611. Regional Field Study. (6).**
A comparative study of selected regions of the world, including library study of the regions to be traversed, a minimum of sixteen days to study in the regions, and oral and written reports. **PREREQUISITE:** Permission of the instructor.
- 7123. Physiography of the Eastern United States. (3).**
Systematic study of the evolution and distribution of landscape forms in the eastern United States, **PREREQUISITE:** One of the following courses: Geography 1102, 6121, or Geology 1101.
- 7124. Physiography of the Western United States. (3).**
Systematic study of the evolution and distribution of landscape forms

in the western United States. PREREQUISITE: One of the following courses: Geography 1102, 6121, or Geology 1101.

7202. Economic Geography: Agricultural. (3).

A survey of agricultural products and agricultural regions of the world, and the role of agriculture in world economy.

7212. Economic Geography: Industrial and Commercial. (3).

A global survey of the extractive industries, of the manufacturing regions, and of the major trade areas and trade routes.

7403. Historical Geography of Latin America. (3).

A comprehensive investigation of the cultural and physical factors operative in the population movements and settlement patterns in Latin America during selected periods and in selected areas.

7422. Political Geography. (3).

The content and philosophy of political geography as illustrated by a broad survey of major writers in the field followed by student analysis of individual nation-states.

7434. Transportational Lands. (3).

Planning and allocation of urban land used for water, rail, street, and air transportation.

7435. Commercial Lands. (3).

Planning, analysis, and allocation of urban land used for commercial purposes; particularly, the Central Business District, commercial strips along arterial streets, and the new outlying shopping centers.

7441. Population Geography. (3).

A survey of the density, distribution, migrations, trends, and settlement patterns of world population.

†7452. Introduction to Techniques of Research and Presentation. (3).

An analysis of the scholarly use of source materials and bibliographical aids for the effective presentation of research findings in oral and written form.

7461. Development of Geographic Thought. (3).

A course vital in acquainting the serious minded geography student with the various types and sources of geographic literature, its nature and content, and the growth and development of geographic thought.

7503. Advanced Cartography. (3).

A study of the ways by which data are presented and interpreted through maps, charts, graphs, and tables.

7521. Quantitative Methods. (3).

The application of quantitative methods in geographic analysis. PREREQUISITE: Permission of the instructor.

7602. Seminar in Climatology. (3).

Systematic study of the classification and distribution of climates. PREREQUISITE: Geography 6111.

7603. Seminar in Africa. (3).

Regional and/or systematic analysis of selected areas in Africa.

- 7604. Seminar in Anglo-America. (3).**
Regional and/or systematic analysis of selected areas in Anglo-America.
- 7605. Seminar in Latin America. (3).**
Regional and/or systematic analysis of selected areas in Latin America.
- 7606. Seminar in Europe. (3).**
Regional and/or systematic analysis of selected areas of Europe.
- 7607. Seminar in the Soviet Realm. (3).**
Regional and/or systematic analysis of selected areas in the Soviet Realm.
- 7608. Seminar on The Far East. (3).**
Regional and/or systematic analysis of selected areas in The Far East.
- 7621. Special Problems. (1-3).**
(May be repeated for a maximum of 9 credits). Independent investigation of a research problem selected in consultation with the instructor.
- †7996. Thesis. (3-6).**
A student registering for this course must have demonstrated, to two or more members of the geography staff, superior ability in the field of geographic content and in the organization and presentation of subject matter.
Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School at the time of registration.
PREREQUISITE: Approval of supervising teacher and department chairman.

†Grades of S, U, or P will be given.

GEOLOGY

PROFESSOR ANTHONY CARIANI, *Chairman*
Room 313, Ellington Hall

In the division of Geology, graduate students who select Geology as a major area will consult their major adviser as to the program of study; however, Geology 7996 is required of all those who major in Geology.

- 6121. Optical Crystallography. (4).**
The principles and methods of study of optical crystallography. The use of the polarizing microscope in the identification of minerals by the immersion method. **PREREQUISITE:** Consent of instructor.
Two lecture, four laboratory hours per week.
- 6322. Microscopic Petrology. (4).**
Classification, description, and thin-section study of rocks by means of the petrographic microscope. **PREREQUISITE:** Geology 6121.
Two lecture, four laboratory hours per week.
- 6332. Introduction to Geochemistry. (3).**
Study of the geological and chemical processes which govern or control the migration and distribution of the elements and atomic species in the earth in space and time. **PREREQUISITE:** Consent of instructor.
Three lecture hours per week.

6352. Sedimentary Petrology. (4).

Examination of sedimentary rocks in the field, in hand specimen, and through the microscope with the view of explaining sedimentary rock classification, the post depositional changes that occur in sediments and the bearing of these factors on geology as a whole. PREREQUISITE: Geology 3712, 4121, or consent of instructor.

Three hours of lecture, two hours of lab.

6411. Micropaleontology. (3).

A study of microscopic fossils. Morphology, classification, evolution, and stratigraphic distribution of some of the more common groups. Photomicrography and laboratory techniques in preparing micro-fossils for study. PREREQUISITE: Consent of instructor.

Six laboratory hours per week.

6511. Economic Mineral Deposits. (3).

Origin, occurrence, and composition of metallic and non-metallic mineral deposits. PREREQUISITE: Geology 2312 and 2512 (Mineralogy).

Three lecture hours per week.

6601. Engineering Geology. (3).

The application of the principles and knowledge of geology to engineering practice, especially in highway construction, dam sites, foundations, water resources and location of certain engineering materials. PREREQUISITE: Consent of instructor.

7211. Geology of Eastern North America. (3).

Stratigraphic and structural development of Eastern North America. Reports, discussions, and lectures. PREREQUISITE: Geology 1201 (Historical Geology).

Three lecture hours per week.

7212. Geology of Western North America. (3).

Stratigraphic and structural development of Western North America. Reports, discussions, and lectures. PREREQUISITE: Geology 1201 (Historical Geology).

Three lecture hours per week.

7321. X-Ray Diffraction Techniques. (3).

The application of x-ray diffraction techniques to crystallographic problems. PREREQUISITE: Consent of instructor.

One lecture, four laboratory hours per week.

7331. Advanced Geochemistry. (3).

Study of selected topics, particularly mineral phase equilibria, geochronology, trace element and isotope distribution. PREREQUISITE: Geology 6332 or consent of instructor.

Three lecture hours per week.

7340. Clay Mineralogy. (3).

The origin, occurrence and properties of well-crystallized and fine-grained layer silicates and related minerals are discussed in terms of their chemical and structural variations. PREREQUISITE: Consent of instructor.

†7360. Advanced Study in Mineralogy and Crystallography. (1-4).

Directed laboratory or field research project selected in consultation with instructor. Report required. Hours and credits to be arranged.

†7370. **Advanced Study in Petrology.** (1-4).

Directed laboratory or field research project selected in consultation with instructor. Report required. Hours and credits to be arranged.

7411. **Advanced Micropaleontology.** (3).

Taxonomy, morphology, ecology and stratigraphic distribution of microorganisms with emphasis on the Foraminifera and the Ostracoda. PREREQUISITE: Geology 6411 or consent of instructor.

Six laboratory hours per week.

7421. **Stratigraphic Paleontology.** (3).

Discussion of paleoecologic and biostratigraphic principles and ideas. PREREQUISITE: Consent of instructor.

Three lecture hours per week.

†7440. **Advanced Study in Paleontology.** (1-4).

Directed laboratory or field research project selected in consultation with instructor. Report required. Hours and credits to be arranged.

†7510. **Advanced Study in Geotectonics.** (1-4).

Directed laboratory or field research project selected in consultation with instructor. Report required. Hours and credits to be arranged.

7551. **Mineralography.** (3).

Identification of ore minerals in polished sections by microchemical tests under the ore microscope. Interpretation of the textural relations and the determination of paragenesis. PREREQUISITE: Consent of instructor.

Six laboratory hours per week.

7631. **Seminar in Geology.** (1).

7641. **Seminar in Geology.** (1).

7651. **Seminar in Geology.** (1).

7661. **Seminar in Geology.** (1).

†7996. **Thesis.** (6).

†Grades of S, U, and P will be given.

HEALTH, PHYSICAL EDUCATION, AND RECREATION

PROFESSOR RALPH L. HATLEY, *Chairman*
Room 211, Field House

In the department of Health, Physical Education, and Recreation, graduate students may place a major emphasis in the areas of Health, Physical Education, or Recreation.

Prerequisites: A minimum of 24 undergraduate semester hours of Health, Physical Education, or Recreation, or a combination thereof is required for unconditional admittance.

Requirements: A total of 33 semester hours is needed for graduation, of which, 21 semester hours are required for major emphasis area, nine semester hours in the collateral area, and three semester hours elective.

The required 21 semester hours for each major emphasis area are as follows:

Health—HPER 6602, 6702 or 6302, 6902, 7124, 7132, 7142, and 7204.

Physical Education—HPER 7103, 7124, 7132, 7142, 7204, 7404, and 7603 or 7314 or 7144.

Recreation—HPER 7132, 7142, 7204, 7305, 7404 or 6204, 7405, and 7505.

The course HPER 7996 may be substituted for HPER 7132 or 7142.

The successful completion of an oral and/or written examination is required.

A written or oral examination may be requested by the department in which the collateral area has been chosen.

Minimum state teacher certification requirements must be met either prior to or during the period of regular graduate work in either Health or Physical Education. In the area of Recreation this certification does not apply.

For the collateral area, 9 semester hours as approved by the adviser, 3 semester hours of which must be selected from the following two courses:

P.E. 7124—Curriculum Construction in Health Education and Physical Education (3).

P.E. 7144—Development and Supervision of an Elementary School Health and Physical Education Program (3).

6204. Test and Measurements in Health and Physical Education. (3).

A study of the various tests in the field of health and physical education, including uses and interpretation of elementary statistical techniques.

6205. Supervised Clinical Training in Recreation Therapy. (6).

Supervised clinical training in the Recreational Therapy Department of the Physical Medicine and Rehabilitation Service at the Memphis V. A. Hospital. Instruction will be given in arts and crafts, radio, television programming, social activities, adapted sports, music, allied ward and clinic activities for patients and varied illnesses and disabilities.

6302. Observation in Community Agencies. (3).

This course is planned to introduce the student to a wide variety of community health and welfare agencies. Opportunity to visit in official and volunteer agencies is provided. Purpose, objectives, functions and programs are presented by representatives in each agency. Application for the course should be made at least 60 days before the student desires to enroll in the course. **PREREQUISITE:** Permission of Chairman of Department.

6403. Supervised Clinical Training in Corrective Therapy. (6).
(formerly Clinical Practice)

Supervised clinical practice in the Department of Physical Medicine and Rehabilitation Service at the Kennedy V. A. Hospital. Instruction will be given in the conditioning, ambulation and self-care of patients with neurological, pulmonary, geriatric, neuropsychiatric, speech, blind, spinal cord injuries, cardiac, and other types of disabilities.

6405. Organization and Administration of Recreation. (3).

An understanding of community organization, its philosophy, foundation and principles. An understanding of selected administrative practices that relate to successful recreational organization and administration.

6503. Organization and Administration of Health and Physical Education. (3).

A study of administrative problems of health and physical education, including curriculum, facilities, buying and caring for equipment, general class organization, and organization of an intramural program.

6602. Supervision and Administration in Health. (3).

A study of the basic functions, principles and procedures of supervision and administration as applied to health. Emphasis is placed on the relationship and responsibilities of personnel in planning, promoting, and improving and evaluating the total health activities in the family-centered health services. Legal and legislative aspects of health activities are included.

6702. Trends and Problems in Public Health. (3).

A review of the historical development and current trends in professional nursing as a community service; the various needs and demands for medical care; the contribution of the professional personnel in providing for total health services and education.

6902. Health Statistics. (3).

A study of the statistical method including collection, analysis and presentation of numerical data pertaining to health problems.

7103. Foundations of Physical Education. (3).

The interpretation of the objectives of physical education as related to scientific facts contained within the biological, psychological, and sociological fields of study.

7124. Curriculum Construction in Health

Education and Physical Education. (3).

Consideration is given to the entire program of instruction in health education and physical education in the public schools; methods of instruction, standards of achievement, evaluation of results, and the preparation of courses of study.

7132. Current Readings in Health, Physical Education, and Recreation. (3).

Directed independent reading in the areas of Health, Physical Education, and Recreation. Materials selected to strengthen deficient areas of study. **PREREQUISITE:** Consent of instructor.

7134. Supervision of Health and Physical Education. (3).

The purpose of this course is to present and discuss the duties and problems of the supervisor of health and physical education in the school and community.

7142. Seminar in Health, Physical Education, and Recreation. (3).

Special study of selected current problems in these areas. For the most part, individual studies will be pursued with group analysis and discussion at regular class meetings. **PREREQUISITE:** Consent of instructor.

7144. Development and Supervision of an Elementary School

Health and Physical Education Program. (3).

Consideration is given to the entire program of instruction in health education and physical education in the elementary schools; methods of instruction, standards of achievement, organization and supervision of the program. (Intended for elementary school teachers as well as principals and supervisors).

7152. Special Problems in Health Education. (1 to 3).

This course is designed to afford opportunity for prospective or in-service school and professional personnel to work individually or in groups in carrying out a research project.

7153. Special Problems in Physical Education. (1 to 3).

This course is designed to afford opportunity for prospective or in-service school and professional personnel to work individually or in groups in carrying out a research project.

7204. Introduction to Research in Health and Physical Education. (3).

A study is made of the various methods and techniques of research. A potential problem is selected, analyzed and written according to research standards.

7305. Foundation of a Philosophy for American Recreation. (3).

Deals with the development of a recreation philosophy for America. Studies the social and economic factors that have influenced leisure and concepts of recreation.

7404. Measurement and Evaluation in Health and Physical Education. (3).

This course includes selection, application and evaluation of certain tests appropriate to these areas.

7405. Program Planning in Recreation. (3).

A study of the needs, interests, and problems of people with specific reference to age. A study of social forces affecting recreational planning and programming. Development of an understanding of the principles of program planning, development, and management, including organization, direction, and supervision.

7505. Administration and Supervision of Park and Municipal Recreation. (3).

(formerly Organization and Administration of Group Recreation)

A study of the development of the recreational movement. Principles and practices in the administration of a wholesale leisure-time program and the place of the school and its personnel in community recreational life.

7603. The Administration of Athletics. (3).

For athletic directors, supervisors, athletic coaches and principals. A study of representative athletic administrative procedures for colleges, public school systems, and municipal athletic leagues. Fiscal procedures and business management are stressed.

7605. Supervised Practicum in Recreation. (3-9).

Field experience of an internship nature providing an opportunity for practical application of classroom theory. A range between 140 and 420 clock hours in professional field work in selected recreational settings according to student's particular area of emphasis. No more than six semester hours may apply to a 30 or 33 semester hours degree program. If nine hours is earned, the student must present not less than 36 hours for a non-thesis degree.

7702. Health Education in Organic and Functional Diseases. (3).

The cause, the prevention and the public health aspect of control of certain organic and degenerative diseases are studied. Stress is placed on educational methods of overcoming public attitudes of fear, super-

stition, apathy and misconceptions surrounding such conditions as diabetes, heart disease, cancer, mental illness and geriatrics.

7902. Health Guidance and Counseling. (3).

A study is made of the role and the techniques of the guidance counselor employed to assist individuals to recognize direct personal health problems which arise from physical, emotional and social causes; and to use effectively scientific health facilities in the solution of these problems. Procedures for establishing and using confidential records and referral to professional guidance and rehabilitation agencies are investigated.

†7996. Thesis. (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School.

†Grades of S, U, and P will be given.

HISTORY

PROFESSOR AARON M. BOOM, *Chairman*
Room 342, Administration Building

In the Department of History the Master of Arts degree is offered either with thesis (Plan A) or without thesis (Plan B). Teachers and prospective teachers of history and social science may select either plan. One who expects to pursue work beyond the Master's degree must select Plan A. Students will consult the departmental adviser as to the program of study. The basic requirements are as follows:

Prerequisites: A minimum of 18 semester hours in undergraduate history, except in special cases approved by the Dean of The Graduate School and the Chairman of the Department of History.

Requirements: (1) A total of 33 semester hours for candidates not writing a thesis; (2) A total of 30 semester hours for candidates writing a thesis; (3) No more than 21 semester hours may be taken in one field (United States, Europe, Latin America), including the 6 hours of thesis; (4) A minimum of 15 hours of 7000 level courses in history; (5) A maximum of 6 hours may be taken in a field outside history; (6) History 7000 must be completed by each student; (7) Candidates for the degree must pass a comprehensive written examination conducted by three staff members designated by the student and his adviser. The written examination will be administered once each semester and once during each of the summer terms on a date published by the department. A follow-up oral examination is optional with the examining committee.

For the collateral area, a minimum of 9 semester hours in one field of history (such as U.S., Latin American, European); and at least 3 hours must be in 7000 level courses. **Prerequisites:** a minimum of 9 semester hours in undergraduate history, except in special cases approved by the Chairman of the Department of History.

6125. England in the Age of Reform, 1760-1840. (3).

Readings and discussion on selected topics such as the movements for political and economic reforms, the Industrial Revolution, romanticism, and society of Regency England.

6126. Victorian England, 1840-1900. (3).

Readings and discussion on selected topics such as the development of English liberal thought, Victorian society and values, and imperialism.

6160. **History of Russia before 1801.** (3).
A survey of Russia from early times to the beginning of the reign of Alexander I.
6161. **History of Russia from 1801 to 1917.** (3).
A survey of Russia from 1801 through the Revolution of 1917.
6162. **History of Russia, 1917-present.** (3).
A survey of Russia from 1917 to the present.
6240. **History of Mexico.** (3).
A survey of the political, economic, social, and cultural development of Mexico from ancient times to the present.
6250. **History of Brazil.** (3).
A survey of the political, economic, social, and cultural development of Brazil from early times to the present.
6370. **The Medieval World.** (3).
A study of the history of institutional forms beginning with the decline of the Roman Empire and ending with the beginnings of Renaissance life.
6380. **The Renaissance World.** (3).
A study of the achievements and forces, political and economic, social and cultural, creative and intellectual, which made up the foundation of modern European civilization.
6390. **Europe in the Age of the Reformation.** (3).
A consideration of the religious struggles, the social and intellectual milieu in the sixteenth and early seventeenth centuries.
6401. **Europe in the Age of the Baroque.** (3).
A study of the political crises, the development of monarchial absolutism, the rise of modern science, and the cultural synthesis in the seventeenth century.
6402. **The Age of the Enlightenment.** (3).
A study of intellectual, cultural, social, and political developments in eighteenth-century Europe.
6440. **The Era of the French Revolution.** (3).
A study of the Enlightenment, the French Revolution, and the Napoleonic era.
6451. **Europe, 1815-1870.** (3).
A study of Europe during the period 1815-1870.
6452. **Europe, 1870-1914.** (3).
A study of Europe during the period 1870-1914.
6461. **Europe, 1914-1939.** (3).
A study of Europe during the period 1914-1939.
6462. **Europe, 1939-present.** (3).
A study of Europe since 1939.
6501. **Intellectual History of Europe I.** (3).
Topics in the history of European thought and culture from the thirteenth through the seventeenth century.

6502. **Intellectual History of Europe II.** (3).
Topics in the history of European thought and culture from the eighteenth century to the present.
6620. **Colonial America, 1607-1763.**
A study primarily of the political development and institutions of the English Colonies in America before 1763, with some attention given to Spanish, French, and Dutch colonization.
6630. **Era of the American Revolution, 1763-1790.**
A study of the origins and conduct of the American Revolution, the United States under the Articles of Confederation, and the writing and ratification of the Constitution.
6640. **Early National Period, 1790-1850.** (3).
A study of American history from unification until the beginnings of division.
6660. **Civil War, 1850-1865.** (3).
A study of division and conflict.
6670. **Reconstruction, 1865-1877.** (3).
A study of national and sectional issues following the Civil War.
6680. **Emergence of Modern America, 1877-1914.** (3).
A study of the United States from the end of Reconstruction to the outbreak of World War I.
6700. **Recent American History, 1914—present.** (3).
A study of the United States from World War I to the present.
6881. **American Negro History.** (3).
A survey of the role of the Negro in America from Jamestown to the present.
6941. **History of the American Indian.** (3).
A study of the role of the Indian in American History.
7000. **Introduction to Historical Research and Writing.** (3).
A study of the mechanical techniques of historical composition, the nature and use of various kinds of historical source materials, bibliographical aids, and methods of historical synthesis. Required of all history majors.
7120. **Studies in British History Since 1485.** (3).
Conference and reports, three hours a week.
7160. **Studies in the Soviet Union and World Communism.** (3).
Conference and reports, three hours a week.
7210. **Studies in Latin American History.** (3).
Conference and reports, three hours a week.
7320. **Studies in Ancient History.** (3).
Conference and reports, three hours a week.
7376. **Studies in the Middle Ages.** (3).
Conference and reports, three hours a week.

7380. **Studies in the Renaissance.** (3).
Conference and reports, three hours a week.
7400. **Studies in Modern European History.** (3).
Conference and reports, three hours a week.
7521. **Studies in European Diplomacy, 1848-1919.** (3).
Conference and reports, three hours a week.
7522. **Studies in European Diplomacy, 1919-1939.** (3).
Conference and reports, three hours a week.
7630. **Studies in Early American History (to 1800).** (3).
Conference and reports, three hours a week.
7640. **Studies in United States History, 1800-1865.** (3).
Conference and reports, three hours a week.
7680. **Studies in United States History, 1865-1917.** (3).
Conference and reports, three hours a week.
7700. **Studies in United States History, 1917-1950.** (3).
Conference and reports, three hours a week.
7871. **Studies in United States Urban History.** (3).
Conference and reports, three hours a week.
7875. **Studies in United States Diplomatic History.** (3).
Conference and reports, three hours a week.
7920. **Studies in Southern History.** (3).
Conference and reports, three hours a week.
7940. **Studies in the American West.** (3).
Conference and reports, three hours a week.
7960. **Studies in State and Local History.** (3).
Conference and reports, three hours a week.
- †7996. **Thesis.** (6).
The student must write and defend satisfactorily a thesis on a subject approved by his major professor.

†Grades of S, U, and P will be given.

MANAGEMENT

ASSOCIATE PROFESSOR JAMES M. TODD, *Chairman*
Room 101, The College of Business Administration Building

In the Department of Management, qualified students may work toward the M.S. or the M.B.A. degree.

- A. Requirements for the M.B.A. degree are summarized on pages 43-44. The 12 hours of concentration and electives must be approved by the department.
- B. Prerequisites for M.S. in Management:
In addition to Core I prerequisites, students should have completed or complete all necessary prerequisites for the advanced course work.
- C. Each candidate for the M.S. degree in Management must complete a minimum of 33 semester hours and pass a written and/or oral examination.

The 33 semester hours comprising the M.S. degree include 21 semester hours of approved work in the major and 12 hours in a collateral area approved by the student's adviser. At least 24 of the 33 semester hours required must be in courses designated primarily for graduate students (7000 level or above).

6210. Personnel Administration. (3).

Employer-employee relationships; job analysis; recruitment, selection, training, transfer, promotion, and dismissal of employees; industrial unrest; wage plans and policies; employee health, interest and morale; dealing with unions.

6220. Collective Bargaining. (3).

Labor-management relations from the standpoint of collective bargaining contracts. Emphasis is given to the process of negotiating agreements, including procedures, tactics and subject matter.

6410. Management of Business Enterprise. (3).

Consideration is given to over-all policy formation and practice in the operation of new and going business concerns. Emphasis is placed on problems of nonfinancial management. PREREQUISITE: Management 3410.

6420. Human Relations in Business. (3).

A study of the principles of human relations as applied to business management. PREREQUISITE: Management 3410.

6430. Introduction to Operations Research. (3).

An introductory study of decision-making which concentrates on the model building process within the decision theory framework. Topics of linear programming, waiting line theory, game theory and statistical analysis of business problems will be approached from the manager's point of view with emphasis on problem identification. PREREQUISITE: Management 3711.

6510. Production Management II. (3).

A course devoted to solving typical problems that arise in the planning, layout, control, operation, and administration of a manufacturing enterprise. PREREQUISITE: Management 3510.

6520. Production Control. (3).

A study of the elements of production and their coordination emphasized by visits to industrial plants. Three hours lecture.

6530. Plant Layout. (3).

Study of industrial plants—with emphasis on floor plans and placement of facilities. Three hours lecture. PREREQUISITE: Permission of instructor.

6540. Time and Motion Analysis. (3)

Work simplification, including analysis of jobs and trades, as applied in time and motion. Three hours lecture. PREREQUISITE: Management 6520.

6750. Computer Programming Principles and Applications. (3).

A course emphasizing the programming of electronic digital computers. Current programming languages will be taught such as FORTRAN AND COBAL. The students will be encouraged to program and run several business oriented problems in both languages. PREREQUISITE: Management 3750 and one college level mathematics course, or permission of the instructor.

6760. Systems Analysis. (3).

A problem oriented course emphasizing a quantitative approach to problem-solving with computer programming support. Problem definition, systems flow charting, and block diagramming will be utilized in solving quantitative business problems. Where possible, the problems will be solved with the aid of the computer, using library routines or a current problem-oriented language such as FORTRAN. PREREQUISITE: Management 4750 and Management 3711.

6780. Systems Design for Business Activities. (3).

Emphasis will be given to computer systems design for typical business applications involving the automation of business activities. This course will concern estimates of computer requirements; organizational arrangement; planning the total system; flow-charting; conversion problems; cost and performance evaluation. The objective is to simulate the middle level executive role in the transition and integration of business operations into computer oriented systems. PREREQUISITE: Management 3750, Management 3711.

6790. Management Information and Reporting Systems. (3).

A comprehensive view of the decision-maker's information requirements and the role of current information gathering means and methods. Problems and techniques concerning the design and installation of responsive systems will be examined with special attention to the executive use of the system's product. A systems approach utilizing current planning and control models, such as PERT and CPM, will be studied through current literature and texts in the computer field. PREREQUISITE: Management 3750 and Management 4780.

7210. Seminar in Industrial Relations. (3).

(formerly Advanced Industrial Relations)

A study of selected problems in labor-management relations. PREREQUISITE: Economics 3210.

7410. Seminar in Business Policy. (3).

(formerly Advanced Management of Business Enterprise)

The development of the Top Management viewpoint, the basic objective being to develop executive abilities and creative thinking. Selected problem areas of modern business will be explored, alternative courses of action appraised, and decision-making ability developed. PREREQUISITE: Management 6610, 6410.

7420. Seminar in Management. (3).

Special study of selected current quantitative problems in this area. For the most part, individual studies will be pursued with group analysis and discussion at regular class meetings. PREREQUISITE: Consent of instructor.

7421. Seminar in Management. (3).

Special study of selected current qualitative problems in this area. For the most part, individual studies will be pursued with group analysis and discussion at regular class meetings. PREREQUISITE: Consent of instructor.

7422. Seminar in Organization Theory. (3).

An examination of the principles and techniques of organization covering managerial functions and processes, types of organization structure and the development of managerial concepts in terms of executive action. Both the classical and behavioral approaches to organization will be analyzed. PREREQUISITE: Consent of instructor; Management 6410.

7910. Problems in Management. (1-4).

Directed independent research projects in an area selected by the student with approval of the staff member supervising. PREREQUISITE: 6 hrs. of graduate course work in the area selected.

7920. Readings in Management. (3).

A study of selected readings in the field of Management. PREREQUISITE: Management 4410 or 6410 (Student cannot obtain credit in this course and also in Management 7910 without consent of instructor.)

†7996. Thesis. (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School.

†Grades of S, U, or P will be given.

MARKETING

PROFESSOR CHARLES ROBERT SPINDLER, *Chairman*

Room 105, The College of Business Administration Building

In the Department of Marketing, students may work toward the M.S. or the M.B.A. degree.

A. Requirements for the M.B.A. degree are summarized on pages 43-44. The 12 hours of concentration and electives must be approved by the department.

B. Master of Science in Marketing:

The program is open to students who have an undergraduate degree in Business Administration. The purpose of this program is to provide a depth of competence in the field of marketing. This, in turn, will prepare students for business as well as academic careers.

C. Prerequisites for M.S. in Marketing:

In addition to Core I prerequisites, students should have completed or complete all necessary prerequisites for the advanced course work.

D. Each candidate for a M.S. degree in Marketing must complete a minimum of 33 semester hours (30 hours if a thesis is written) of approved course work and pass a written and/or oral examination. The 33 semester hours comprising the M.S. in Marketing include a minimum of 21 hours in the major. Marketing 7010, Current Aspects of Marketing; Marketing 7011, Marketing Strategies and Tactics; Marketing 7012, Marketing Structure and Administration; and Marketing 7013, Marketing Controls are required in the major area. The remaining 9 to 12 hours are in a collateral area approved by the student's adviser. At least 24 of the 33 semester hours required must be in courses designated primarily for graduate students (7000 level or above).

7010. Current Aspects of Marketing. (3).

A comprehensive review of current marketing literature. Emphasis is placed on Marketing innovations from the standpoint of functions, institutions, and concepts.

7011. Marketing Strategies and Tactics. (3).

An analytical approach to planning as it relates to the marketing activities of a business enterprise. Focus is placed on: (1) Development of a qualitative-quantitative framework for decision-making; and (2) Fundamental strategies and tactics.

7012. Marketing Structure and Administration. (3).

An appraisal and diagnosis of organizational structure and executive action as they relate to marketing decisions regarding both external and internal factors.

7013. Marketing Controls. (3).

A study of the adjustment of marketing operations to predetermined standards or control values in an effort to minimize performance variations. Stress will be placed on communicating to management the vital information necessary for sound administrative and planning decisions.

7015. Research Methodology. (3).

The nature and scope of research philosophy and methods in business. Both primary and secondary research procedures will be studied. Emphasis will be focused on the preparation and presentation of independent research findings.

7020. History of Marketing Institutions and Thought. (3).

An introduction to the concepts and theories advanced in the development of institutions, channels, functions, and processes in the field of marketing.

7021. Pricing Theories and Policies. (3).

An examination of the role of prices in our economy and of price making under varying conditions of competition. Also included is an examination of the acquisitive and social implications of pricing policies.

7022. Behavioral Approaches to Marketing. (3).

An analysis of the contributions of the behavioral science disciplines to consumer motivation, buying behavior, market adjustment, and product innovation. These processes are evaluated with reference to psychological drives and other behavioral science concepts at each stage of distribution.

7023. Quantitative Tools for Marketing. (3).

A critical examination of the various quantitative tools to gain an understanding of both capabilities and their limitations in marketing operations.

7030. Marketing Seminar. (3).

Special study of current problems in marketing. For the most part, individual studies will be pursued with group analysis and discussion.

7901. Problems in Marketing. (3).

Directed independent research projects in an area selected by the student with the approval of the staff member supervising. **PRE-REQUISITE:** 9 hours of graduate course work in Marketing.

†7996. Thesis. (3-6).

Application for writing a thesis must be filled out on an approved form after consultation with the major professor and filed with the dean of The Graduate School.

†Grades of S, U, or P will be given.

MATHEMATICS

PROFESSOR HOWARD S. KALTENBORN, *Chairman*
Room 429, J. M. Smith Hall

For the degree of Master of Science, a student may complete both a major and a collateral area in either mathematics or statistics, or he may complete a major in one of these fields and a collateral area in any department in which he is qualified to do graduate work. For the degree of Master of Science in Teaching, a student may complete a major in mathematics and a collateral area as approved by his adviser.

The minimum requirements for the master's degrees are as follows:

Master of Science	33 hours without a thesis, or 27 hours with 3-hour thesis, or 24 hours with 6-hour thesis
Master of Science in Teaching	33 hours

The candidate will be examined in the work he has taken in mathematics or statistics and, where applicable, in his collateral area and thesis.

The comprehensive examination will be oral.

Mathematics may be used as a collateral area provided the student has the necessary undergraduate prerequisites.

6111. Philosophy of Mathematics. (3).

Logical methods; axiomatic systems; independency and consistency; the nature of mathematics. PREREQUISITE: Mathematics 3111.

6151. History of Mathematics. (3).

The development of mathematics from the earliest times to the present; problem studies; parallel reading and class reports. PREREQUISITE: Mathematics 3111.

6221. Theory of Numbers. (3).

Divisibility properties of integers; prime numbers; congruences; Diophantine equations; quadratic residues; number theoretic functions. PREREQUISITE: Mathematics 3111.

6241. Linear Algebra. (3).

Matrices, vector spaces, linear transformations, polynomials, determinants. PREREQUISITE: Mathematics 2322.

6351. Real Variables. (3).

Continuous functions; uniform continuity; differentiation; integration; improper integrals; sequences and series; power series; uniform convergence. PREREQUISITES: Mathematics 2322, 3111.

6361. Complex Variables. (3).

Complex numbers; point sets and mappings; analytic functions; integration. PREREQUISITE: Mathematics 2322.

6391. Applied Mathematics. (3).

Laplace transforms; Fourier series; introduction to partial differential equations. PREREQUISITE: Mathematics 3391.

6392. Applied Mathematics. (3).

Partial differential equations. PREREQUISITE: Mathematics 6391.

6411. Topology. (3).

Introductory set theory; metric spaces; topological spaces; mappings; Hausdorff spaces; connectedness and compactness. PREREQUISITES: Mathematics 2322, 3111.

6711. Advanced Computer Programming. (3).

Advanced digital computer programming including the full utilization of Operating Systems, Scientific Sub Routine Packages, and hardware capabilities such as tape and disk data management. PREREQUISITE: Mathematics 3711.

6721. Numerical Analysis. (3).

Study of computer-oriented methods for solution of polynomial and transcendental equations and ordinary differential equations; matrix calculations including inverses, determinants, eigenvalues, eigenvectors, etc.; numerical quadrature; polynomial interpolation; least squares curve fitting. PREREQUISITES: Mathematics 2321 and 3711.

7171. Workshop in Junior High Mathematics. (3).

This course is designed to provide in-service training, with emphasis on new course content.

7173. Workshop in Senior High Mathematics. (3).

This course is designed to provide in-service training, with emphasis on algebra.

7174. Workshop in Senior High Mathematics. (3).

This course is designed to provide in-service training, with emphasis on metric geometry.

7181. Introduction to Modern Mathematics. (3).

Basic theory in the logical foundations of arithmetic; the postulational development of the number system; symbolic logic.

7221. Algebraic Number Theory. (3).

Farey fractions; simple continued fractions; distribution of primes; algebraic numbers; partition function. PREREQUISITE: Mathematics 6221.

7222. Algebraic Number Theory. (3).

Selected topics from advanced theory of numbers. PREREQUISITE: Mathematics 7221.

7241. Linear Algebra. (3).

Invariant direct-sum decompositions; the rational and Jordan forms; inner product spaces; bilinear forms. PREREQUISITE: Mathematics 6241.

7261. Algebraic Theory. (3).

Theory of groups, rings, integral domains, and fields, with applications. PREREQUISITE: Mathematics 3111 or 7181.

7262. Abstract Algebra. (3).

Theory of semi-groups, rings, ideals, modules, integral domains and fields; extension of rings and fields; lattices. PREREQUISITE: Mathematics 7261.

7351. Real Variables. (3).

Functions of variables; continuity; iterated limits; partial differentiation; multiple and iterated integrals; Riemann-Stieltjes integral; Lebesgue theory. PREREQUISITE: Mathematics 6351.

7361. Complex Variables. (3).

Power series; calculus of residues; conformal representations. PREREQUISITE: Mathematics 6361.

- 7381. Calculus for Secondary Teachers. (3).**
Function concept; elementary function theory; selected topics from analytic geometry and calculus.
- 7391. Special Functions. (3).**
Infinite products; asymptotic series; generalized hypergeometric functions; the confluent hypergeometric function. PREREQUISITE: Mathematics 6391.
- 7392. Special Functions. (3).**
Methods of obtaining and using generating functions; orthogonal polynomials with applications. PREREQUISITE: Mathematics 7391.
- 7411. Topology. (3).**
Product spaces; separable spaces; completeness; dimension; simplices; complexes; chains; homologies. PREREQUISITE: Mathematics 6411.
- 7511. Geometric Theory. (3).**
Foundations of geometry; extensions of Euclidean geometry; non-Euclidean geometry; introduction to projective geometry. PREREQUISITE: Mathematics 3111 or 7181.
- 7521. Algebraic Geometry. (3).**
Erlanger program; linear transformations, subgeometries of projective geometry; metric geometries, inversion geometry. PREREQUISITE: Mathematics 7511.
- 7581. School Geometry from an Advanced Standpoint. (3).**
Vector geometry, transformation geometry, geometric approach to calculus.
- 7681. Probability for Secondary Teachers. (3).**
Probability spaces, theory of statistical inference, physical interpretations of probability.
- 7721. Numerical Analysis. (3).**
A continuation of Mathematics 6721; numerical methods for solving applied problems in calculus and differential equations. PREREQUISITE: Mathematics 6721.
- 7741. Linear Programming Techniques. (3).**
Convex sets and linear inequalities; simplex computational procedure, quality problems of linear programming; revised simplex method; parametric linear programming; sensitivity analysis; theory of games. PREREQUISITE: Mathematics 6241.
- 7743. Non-Linear Programming Techniques. (3).**
The theory of non-linear programming including extensions to parametric, integer and stochastic situations. PREREQUISITE: Mathematics 7741.
- 7791. Problems in Computer Science. (1-4).**
Directed independent problem research and program design, writing and documentation in an area selected by the student with approval of both the adviser and supervising staff members. PREREQUISITE: Mathematics 6711.
- †7996. Thesis. (3-6).**

STATISTICS

6611. Statistical Methods. (3).

Intended for students in the engineering, physical and mathematical sciences. Binomial, hypergeometric, Poisson, multinomial and Chi-square distributions; tests of randomness and non-parametric tests; t-tests; tests of hypotheses; correlation analysis. **PREREQUISITE:** Mathematics 2321.

6613. Introductory Statistical Theory. (3).

Distribution of functions of random variables; limiting distributions; correlation and regression; Neyman-Pearson Lemma; likelihood ratio tests; sufficient statistics; point estimation. **PREREQUISITE:** Statistics 3631.

6631. Probability. (3).

Stationary and non-stationary stochastic processes; Markov chains and applications; continuous time Markov chains; Poisson processes and applications; Brownian motion; branching processes. **PREREQUISITE:** Statistics 3631, Mathematics 3241.

7611. Statistical Methods. (3).

Continuation of Statistics 6611. Partitioning of sums of squares; tests for equality of variances and means; one-way and two-way analysis of variance; simple linear regression; multiple regression; simple experimental designs; analysis of covariance. **PREREQUISITE:** Statistics 6611.

7621. Quantitative Statistical Methods. (3).

Introduction to the concepts of random sampling and statistical inference, estimation and testing hypotheses; chi-square tests, simple regression analysis. **PREREQUISITE:** Mathematics 1203 or 1211.

7622. Quantitative Statistical Methods. (3).

A continuation of Statistics 7621; multiple and curvilinear regression analysis; analysis of variance; introduction of basic experimental design. **PREREQUISITE:** Statistics 7621.

7631. Stochastic Processes. (3).

Stationary and non-stationary stochastic processes; autoregressive processes and correlogram analysis, harmonic-periodogram and spectral analysis; Markoff and diffusion processes. **PREREQUISITE:** Statistics 6631.

7641. Analysis of Variance. (3).

The analysis of variance in experimental statistics, single and multiple classification, factorials, analysis of designed experiments including randomized blocks, Latin squares, split plots, simple confounded designs, multiple comparisons and orthogonal contrasts. **PREREQUISITE:** Statistics 6611.

7642. Experimental Design. (3).

Fundamental concepts in designing experiments, justifications of linear models, randomization, principle of blocking, use of concomitant observations, principle of confounding, fractional replication, composite designs, incomplete block designs. **PREREQUISITE:** Statistics 7641.

7643. Least Squares and Regression Analysis. (3).

Simple, multiple, and curvilinear regression analysis, orthogonal polynomials, analysis of non-orthogonal and incomplete experiments by

least squares methods, computer methods for least squares problems. PREREQUISITES: Mathematics 3241, Statistics 6611.

7645. Sampling Techniques. (3).

Planning, execution, and analysis of sampling from finite populations; simple, stratified, multi-stage, and systematic sampling; ratio estimates. PREREQUISITE: Statistics 6611 or Statistics 6613.

7647. Order Statistics and Non-Parametric Methods. (3).

Use of order statistics and other distribution-free statistics for estimation and testing hypotheses, exact non-parametric tests and measures of rank correlation. PREREQUISITE: Statistics 6611 or Statistics 6613.

7651. Theory of Linear Models. (3).

Quadratic forms, point of interval estimations, multivariate normal distribution; linear models, general linear hypothesis of full rank; computing techniques; functional relationships. PREREQUISITES: Mathematics 6241, Statistics 6611, 6613.

7652. Theory of Linear Models. (3).

Regression models; experimental design models; cross-classification model; factorial models; incomplete block models; variance components; mixed models. PREREQUISITE: Statistics 7651.

7654. Inference Theory. (3).

General theory of estimations and sufficiency; maximum likelihood and Bayesian estimations; minimum variance estimations; Neyman-Pearson theory of testing hypotheses; elements of decision theory. PREREQUISITE: Statistics 6613.

†Grades of S, U, or P will be given.

MUSIC

PROFESSOR ROBERT SNYDER, *Chairman*
Room 123B, Music Building

In the Department of Music, graduate students may select from the following degree programs:

- A. Master of Music degree in applied music (composition, piano, voice, organ, violin, violoncello, harp, winds, percussion), music history, and music theory, consisting of the major area (15-17 hours, including thesis or recital), a minor area (6 hours) and music electives (9 hours).
- B. Master of Arts degree in applied music, music history and music theory, consisting of a major area (15-18 hours, including thesis or recital), music history and music theory electives (9-12 hours) and outside minor (humanities). A language proficiency is required for the M.A. in music literature.
- C. Master of Music degree in sacred music, consisting of 9 hours in a sacred music core, 9 hours of applied music (including recital), 6 hours of music history, and 3 hours each of acoustics, choral techniques, and an elective.
- D. Master of Music Education degree, consisting of 9 hours in a music education core, six hours of professional education, and six hours each of applied music, music history and music theory.

General basic requirements for music majors are outlined below.

- I. Prerequisites to graduate standing in music.
 - A. A satisfactory grade shall be made on the aural and written theory qualifying examinations.
 - B. A satisfactory grade shall be made on the qualifying examination in music history and literature.
 - C. A successful audition (or acceptable compositions in various media for potential composition majors) shall be presented when applicable to the anticipated degree program.
- II. Prerequisites to degree candidacy in music.
 - A. The program of a student's intended degree shall be planned.
 - B. A student shall declare his major and minor areas.
 - C. A thesis topic shall be chosen and approved on those degree programs involving the thesis.
 - D. The piano proficiency examination shall be taken.
- III. Prerequisites for graduation
 - *A. A student with a major in applied music must successfully complete an audition for his public recital and shall perform that recital.
 - B. A student of whom a thesis is required shall submit an acceptable thesis.
 - C. The comprehensive examination/s shall be taken.

Complete details of this outline may be had by writing the Director of the Graduate Program, Department of Music.

7000. Bibliography and Research Methods. (3).

An introduction to methods in research and bibliographic aids, and an evaluation of those aids which are considered most essential for musical research.

7010. Graduate Ensemble. (1).

Graduate students will be required to participate in ensemble during each semester in residence (a minimum of two credits required for graduation). Specific ensemble assignments will be made by the faculty adviser.

7030. Composition. (3).

Free composition in all forms. Applicants to this course are required to submit original works in various forms and media as proof of maturity and technical preparation for graduate work. The course number may be repeated with the instructor's permission for successive semesters.

7031. Theory I. (3).

Advanced harmony and counterpoint in sixteenth, seventeenth, and eighteenth century styles. Writing and analysis in the contrapuntal style of the sixteenth century in four to eight voices, triple and quadruple counterpoint, pre-fugal styles. Italian and English madrigal. Eighteenth century contrapuntal technique; invention, chorale elaboration, suite, two- and three-voice fugues in the style of Bach and Handel.

7032. Theory II. (3).

Advanced harmony and counterpoint in eighteenth, nineteenth and twentieth century styles. Writing and analysis in the larger eighteenth

*The performer's certificate may be awarded outstanding students who qualify.

century forms; four- and five-voice figures, double fugue, chaconne, passacaglia, and orchestral forms. Chromatic harmony. Impressionism. Harmonic and contrapuntal practices in the twentieth century.

7033. Pedagogy of Theory. (3).

A practical course in classroom procedure. Demonstrations by students and instructor in teaching the rudiments, elementary and advanced theory, various styles of counterpoint, and ear training. A study of various theoretical systems. Bibliography.

7034. Analytical Techniques. (3).

Techniques of analysis of style and structure of music from all periods of the history of music.

7035. Advanced Ear Training. (3).

Harmonic, contrapuntal, and melodic dictation drawn from masterworks of composers from Haydn to the present. Employment of all clefs. Sight singing.

7036. Advanced Orchestration. (3).

Investigation of orchestration practices of the great composers from the classical period to the present. Sections of non-orchestral works by representative composers will be orchestrated in the style of the period of their composition.

7037. Acoustics of Music. (3).

Designed to acquaint the student with the physical properties of sound, their relations to instrumental sound production, and the effect of architecture and interior design upon sound and especially upon musical performance.

7131. Medieval Music. (3).

Pre-Christian music; Eastern music; chant; liturgies; notation, instruments; performance practice.

7132. Renaissance Music. (3).

The development of polyphonic and homophonic forms from Plainchant; the role of instrumental music; performance practice.

7133. Baroque Music. (3).

Origins of large vocal forms; rise of instrumental ensembles; performance practice, keyboard literature; the concerto principle.

7134. Classic Music. (3).

The sonata concept in music through Beethoven; opera; chamber music; performance practice.

7135. Romantic Music. (3).

The expansion of the sonata concept; origins of musical romanticism; music drama and symphonic poem; Lieder; character piece; Nationalism.

7136. Music in the Twentieth Century. (3).

Music since Debussy and Mahler with emphasis on current developments and techniques.

7137. Studies in Music History.

Study in depth in music literature of a particular genre (opera, sonata, art song, etc.) or the life and work of a particular composer (Beethoven, Schuetz, Monteverdi, Handel, etc.). May be repeated for credit.

- 7231. Advanced Conducting. (3).**
Conducting the concert band, the symphony orchestra, and the chorus in the larger musical forms. Emphasis on interpretation. PREREQUISITE: Permission of Instructor.
- 7232. Music Education Seminar. (3).**
Historical development and basic philosophies in music education. Current trends in school music, curricula, and testing programs. Evaluation of new methods and materials.
- 7233. Choral Literature and Techniques. (3).**
A survey of choral literature from Dunstable to the present, using scores, records, and class performance. Analysis of the scores in terms of style, form, and performance problems. Techniques of teaching and conducting unfamiliar styles.
- 7234. Instrumental Literature and Techniques. (3).**
Specific and intensive research in each student's major instrument, covering (1) history of the instrument, (2) texts, methods and periodicals, (3) orchestral studies, (4) solo and ensemble literature, and (5) listening and performance.
- 7430. The Church and Music Education. (3).**
A comprehensive program constructed to enable a church musician to present programs, study courses and musical activities designed specifically to educate the tastes of various congregations at all age levels. PREREQUISITE: Graduate standing in music.
- 7431. Oratorio and Cantata. (3).**
A study of the larger musical forms of the Church with performances by performing majors. An analytical study of style in performance and in content with suggested use of instruments in addition to the organ. PREREQUISITE: Graduate standing in music.
- 7432. Church Music Arranging. (3).**
A course designed to train the student in the devices of creating anthems from hymn-tunes, some choral arranging for special church needs, and instrumentation for ensembles which would be added to the fundamental use of the organ. Useful in creating Biblical musical productions for service and festival occasions. PREREQUISITE: Graduate standing in music.
- 7830. Independent Study in Opera and Musical Theatre Production. (3).**
A detailed study of opera and musical theatre production to include: choosing of repertoire, translations, budget planning, casting, obtaining of materials, and promotion. Practical experience in the technical aspects of opera and musical theatre. (may be repeated for credit.) PREREQUISITE: Permission of instructor.
- 7835. Independent Project in Opera Direction. (3).**
Actual staging or musical direction of an opera workshop or opera theatre production. (may be repeated for credit) PREREQUISITE: Music 7830 and permission of instructor.
- 7921. Chamber Music. (2).**
An elective course in the performance of music in various styles, periods, media. Open to pianists, instrumentalists, and singers with technical proficiency equivalent to undergraduate senior level. Public performance required each semester.

7994. Recital. (3).

Required of the applied music major. Application for credit for the recital must be filled out on an approved form after consultation with the major adviser and filed with the Dean of the Graduate School.

†7996. Thesis. (3-6).

Required of the music history, music theory and composition majors. The composition or compositions should be of suitable nature to provide for practical performance in public recital or concert. Application for credit for the thesis must be filled out on an approved form after consultation with the major adviser and filed with the Dean of The Graduate School.

APPLIED MUSIC

7320. Brasses. Individual Instruction. (2).*

7420. Organ. Individual Instruction. (2).*

7520. Percussions. Individual Instruction. (2).*

7620. Piano. Individual Instruction. (2).*

7720. Strings. Individual Instruction. (2).*

7820. Voice. Individual Instruction. (2).*

7920. Woodwinds. Individual Instruction. (2).*

7340. Brasses. Individual Instruction. (4).*

7440. Organ. Individual Instruction. (4).*

7540. Percussions. Individual Instruction. (4).*

7640. Piano. Individual Instruction. (4).*

7740. Strings. Individual Instruction. (4).*

7840. Voice. Individual Instruction. (4).*

7940. Woodwinds. Individual Instruction. (4).*

APPLIED MUSIC (INDIVIDUAL LESSONS)

FEES: See page 39 of this bulletin. Fees are paid to the University at the office of the Business Manager.

CREDITS AND GRADES: Two semester hours of credit will be granted for one thirty-minute lesson weekly; four semester hours of credit will be granted for two thirty-minute lessons weekly. Practice hours will be determined by the instructor to meet the needs of the student. Grades are awarded on the same basis and have the same significance as in any other subject.

REGISTRATION: Students will register for individual lessons at the same time and in the same manner that they register for other courses.

*May be repeated for credit in subsequent semesters, but not for the purpose of improving the grade originally earned.

†Grades of S, U, or P will be given.

PHILOSOPHY

PROFESSOR WILLIAM BRYAN BARTON, JR., *Chairman*
Room 319, Clement Hall

The program of graduate study leading to the M.A. degree has been designed to provide the student with a broad base in the standard branches of philosophy, with specialized work at the advanced level in Metaphysics, History of Philosophy, Epistemology, Logic, Ethics, Aesthetics, Philosophy of Religion, Philosophy of Science, and Philosophy of Language.

PREREQUISITES: A minimum of eighteen (18) semester hours in undergraduate philosophy, except in special cases approved by the Dean of the Graduate School and the chairman of the Department of Philosophy.

REQUIREMENTS: (1) At least thirty (30) graduate hours credit, twenty-one (21) of which must be in philosophy, eighteen (18) hours in courses designated primarily for graduate students. Not more than six (6) hours may be counted for thesis; (2) demonstrated knowledge of the History of Philosophy and a general knowledge of the fields of Logic, Ethics, Aesthetics, Epistemology, and Metaphysics. This requirement will be fulfilled by a comprehensive examination to be given some time in the semester in which the student plans to graduate. The examination may not be repeated more than once; (3) a reading knowledge of either French or German. A classical language may be substituted with approval of the chairman; (4) master's thesis—this will be written under the supervision of a member of the graduate faculty. The subject must be approved before the beginning of the semester in which the student will graduate. The thesis must be submitted to the Department of Philosophy at least one month before graduation.

MINOR: Nine (9) semester hours as approved by the graduate adviser; at least three (3) hours at the 7000 level.

6011. Theory of Knowledge. (3).

A critical study of the basic problems of epistemology, with readings in the important philosophers.

6021. Metaphysics. (3).

An analysis of the basic metaphysical concepts and a critical study of old and new theories of the nature of being.

6031. Hegel. (3).

The philosophy of Logic, Nature, and Spirit will be delineated together with a detailed investigation of *The Phenomenology of Mind*.

6301. Classical American Philosophy. (3).

The development of philosophical ideas in America from the Puritans until 1900, and their relationship to the growth of social, political, and scientific thought.

6302. Recent American Philosophy. (3).

The development of philosophy in America from 1900 to the present. Particular emphasis will be given to pragmatism, realism, naturalism, and analytic philosophy.

6371. Philosophy of the Nineteenth Century. (3).

Extensive readings in representative 19th century philosophers from Fichte to Nietzsche. Special attention will be given to such movements as dialectical materialism, existentialism, positivism, Darwinism, neo-Kantianism and English idealism.

6421. Philosophy of Mind. (3).

A critical evaluation and study of contemporary resolutions of the mind-body problem. Account will be taken of modern theories of perception, intentionality, affective and cognitive states, and related issues from the fields of learning theory, phenomenology and depth psychology.

6431. Recent Problems in the Philosophy of Language. (3).

A study is made of the basic characteristics of scientific language; the problems of meaning and existence are given close attention.

6441. Phenomenology and Its Historical Background. (3).

A reading and discussion of basic texts in translation of Husserl's *Ideas*, *Cartesian Meditations* and from the *Crisis of European Science and Phenomenology*.

6632. Advanced Logic. (3).

The nature of axiomatic systems, techniques of formalization, and the logical foundations of mathematics.

7041. Marxism and Democracy. (3).

The development of Hegel's political and social philosophy by the "Hegelians of the left," the communisms and social democrats; liberal responses to the socialist political theory.

7042. Modern Ontologies. (3).

A critical analysis of some of the rival cosmological and metaphysical systems of the twentieth century and an investigation of the contemporary conceptions of the nature of metaphysical explanation.

7043. Seminar in the History of Modern Philosophy. (3).

A two semester course in the history of modern philosophy. Each semester an intensive study is made of some major figure such as Hume, Kant, Hegel, Spinoza, etc.

7044. Seminar in the History of Modern Philosophy. (3).

Continuation of 7043.

7241. Seminar on the Pre-Socratic Philosophers. (3).

A study of the development of philosophy from the Ionians to the Sophists with a discussion of the various historical interpretations of the period.

7242. Seminar on Plato and Aristotle. (3).

An intensive reading of Plato's later dialogues and parts of Aristotle's *De Anima*, *Physics*, and *Metaphysics*.

7531. Problems in Moral Philosophy. (3).

An analysis of the work of leading contemporary ethical theorists with a discussion of such problems as the naturalistic fallacy, the logic of moral discourse, moral skepticism, the distinction between ethics and metaethics, etc.

7641. Axiomatics. (3).

A study of the nature of deductive systems; modern postulation methods; classes; properties of relations; proofs of consistency; completeness and independence.

7671. Philosophy of Science. (3).

Lectures, organized discussions and reports, centering around contem-

porary problems of analysis of scientific methods, arguments, terms, and their social and philosophical consequences.

7721. Aesthetics. (3).

A study of the fundamental issues in aesthetics through an examination of the important classical and contemporary theories of art.

7731. Modern Philosophies of Religion. (3).

A critical evaluation of some contemporary philosophies of religion, with a view to explicating the idea of a philosophical theology and its relation to such problems as the nature of religious language, religion and science, reason and revelation.

†7994. Reading and Research. (3,3).

Individual supervision under a member of the graduate faculty on a topic within the student's major field of interest.

†7996. Thesis. (3-6).

†Grades of S, U, or P will be given.

PHYSICS

PROFESSOR CARROLL IJAMS, *Chairman*
Room 116, Manning Hall

Students majoring in Physics for the Master of Science Degree are required to present as a prerequisite 32 semester hours of undergraduate Physics courses including upper division Mechanics, Electricity and Magnetism, and approved Mathematics courses in Calculus and Differential Equations.

After meeting the general degree requirements for admission to The Graduate School, students selecting Physics as a major subject will consult with the Department Chairman and be assigned to a graduate adviser to direct his courses of study.

With permission of the graduate advisor, the student may pursue either a course of study in which a thesis is required on the alternate non-thesis program may be selected. In either choice of study, an oral comprehensive examination must be satisfactorily completed before being recommended for graduation.

If the thesis course of study is selected, the following minimum requirements must be satisfied.

1. 18 semester hours of Physics courses numbered 7000 or above, including 6 hours of thesis.
2. Sufficient additional courses to satisfy a minimum of 30 semester hours of work in which 9 may be in a collateral field of study.

If the non-thesis alternate program is selected, the following requirements must be satisfied.

1. 33 semester hours of course work, of which 21 hours must be in Physics courses numbered 7000 or above.
2. 9 semester hours may be selected from a collateral field.

6051. Astrophysics. (3).

Application of radiation laws to the interpretation of stellar structure. Introduction to radiative transfer in atmospheres. The spectral and luminosity classifications of stars, stellar populations and evolution.
Three lecture hours and occasional observation periods per week.

6052. Astrophysics. (3).

A continuation of Physics 6051, with emphasis on interstellar matter, stellar systems, galactic structure radio astronomy.

Three lecture hours and occasional observation periods per week.

6110. Nuclear Physics. (3).

Properties of atomic nuclei, radioactive transitions, alpha, beta and gamma decay. Binding energy, nuclear forces and nuclear models.

6211. Optics. (4).

Geometrical and physical optics including such topics as thin lenses, spherical mirrors, lens aberrations, optical instruments, waves interference, diffraction, absorption, transmission, and scatterings. PREREQUISITE: Physics 3212; Mathematics 2322.

Three lecture, three laboratory hours per week.

6212. Optics. (4).

A continuation of Physics 6211. PREREQUISITE: Physics 6211.

Three lecture, three laboratory hours per week.

6310. Radiosotope Technology. (3).

Properties and detection of radiation, production of isotopes, use of detection devices, radiation chemistry, thickness and density gauging, activation analysis, moisture measurement, safety procedures, analytical tracer techniques, industrial radiography, procurement of radioisotopes and radioisotope licenses, and design of radiochemical laboratories. Not applicable to a major in physics.

Two lecture, two laboratory hours per week.

6410. Introduction to Quantum Theory. (3).

Experimental basis of quantum theory; development of the Schrodinger equation and its solution of simple systems; selected applications in atomic and molecular structure.

Three lecture hours per week.

6510. Thermodynamics. (3).

A mathematical treatment of thermodynamics, including such topics as work, energy, enthalpy, entropy, reversible and irreversible processes, equilibria, specific heats, and phase transitions. RECOMMENDED COREQUISITE: Physics 3112 or 3212.

Three lecture hours per week.

6520. Statistical Mechanics. (3).

Elements of kinetic theory and applications to gases, specific heats, magnetism, etc. Partition functions; introduction to Boltzmann statistics and quantum statistics.

Three lecture hours per week.

6610. Solid State Physics. (3).

Consideration of such topics as lattice vibrations, specific heats, electrical and thermal conductors, in solids, magnetism.

Three lecture hours per week.

6710. Spectroscopy. (3).

Atomic and molecular structure as revealed by the study of radiation emitted and absorbed by substances. Emphasis is on the vector model of the atom and an introduction to infrared and Raman spectra of molecules.

6911. Introduction to Theoretical Physics. (3).

Special mathematical techniques used in the theoretical treatment of physical phenomena, boundary value problems, matrices, Fourier series and integrals, etc. as applied to advanced physical theory.

6912. Introduction to Theoretical Physics. (3).

A continuation of Physics 6911. PREREQUISITE: Physics 6911.

7010. General Physics for High School Teachers. (3).

The course will consist of three one-hour and one two-hour laboratory per week. It is a course designed to cover the basic and fundamental concepts of mechanics, heat, sound, light, electricity and magnetism, atomic and nuclear physics. These topics will be covered by lecture, demonstrations, and actual laboratory experiments. Daily problem assignments, as well as weekly laboratory reports and outside readings, will be required for each participant. Selected topics will be adequately covered and emphasized. Credit for this course does not apply toward a major or minor in chemistry or physics.

7020. Fundamental Concepts of Contemporary Physics for High School Teachers. (3).

The course will consist of three one-hour lectures and one two-hour laboratory session per week. The course material will include many of the newer topics emphasized in the modern high school texts actually in use today. Electronics, the newer phases and concepts of electricity and magnetism, x-rays, radioactivity, and, the basic principles of atomic and nuclear physics will be covered. The principle objective of the course will be to strengthen the background of those teachers now in the field of atomic and nuclear physics. Credit for this course does not apply toward a major or minor in chemistry or physics.

7030. Selected Topics in Modern Physics for High School Teachers. (3).

Some of the more advanced topics of atomic and nuclear physics, together with the basic concepts of solid state physics, electronics, and space technology will be presented. Laboratory experience with some of the more advanced electronic and nuclear equipment will be provided.

Three lecture hours per week.

7040. Mathematical Physics. (3).

A survey of mathematical methods employed in advanced physics on the graduate level. Fourier analysis, complex variables, special function, Eigenvalues, tensor analysis, Green's functions and similar topics will be included, with emphasis upon their application to both theoretical and experimental physics courses.

7041. Mathematical Physics. (3).

A continuation of Physics 7040.

7050. Special Topic in Physics. (3-6).

A course designed to include selected topics of interest and importance in advanced Physics. Individual investigation and reports under the guidance of the major adviser will constitute a major part of the course. Extensive use of the technical library facilities of the area and of staff. This course may be taken for a maximum of six semester hours graduate credit.

7060. Fundamental Concepts of Plasma Physics. (3).

This course consists of such topics as phase space and distribution functions, hydrodynamic equations, interaction of electromagnetic

waves with plasmas, magnetic and kinetic pressures, the Debye length, collisions and radiation, longitudinal oscillations of plasma elements, diffusion mobility and transport phenomena, the pinch effect, and velocity-space plasma instabilities.

7610. Advanced Topics in Solid State Physics. (3).

Introduction to the quantum theory of solids. Band theory, magnetism, superconductivity, lattice dynamics, and other advanced topics.

7710. Advanced Topics in Optical Spectroscopy. (3).

Advanced topics in atomic and molecular spectroscopy, including the interaction of optical radiation with matter, the transition probabilities, hyperfine structure, applications of group theory to spectroscopic problems.

†7913. Physics Seminar. (1).

General meetings for presentation and discussion of recent topics of interest. Graduate students and faculty participate.

†7923. Physics Seminar. (1).

General meetings for presentation and discussion of recent topics of interest. Graduate students and faculty participate.

†7933. Physics Seminar. (1).

General meetings for presentation and discussion of recent topics of interest. Graduate students and faculty participate. PREREQUISITE: Approval of staff; Physics 7923.

†7996. Thesis. (6).

The original investigation of an assigned problem in the area of graduate study to be carried out under the supervision of a qualified member of the staff. This investigation will furnish the material for a thesis. Scientific articles, progress reports, and special problems of interest are reviewed and discussed by the student in seminars each semester. A maximum of six semester hours credit is allowed toward a master's degree.

†Grades of S, U, or P will be given.

POLITICAL SCIENCE

ASSOCIATE PROFESSOR H. R. MAHOOD, *Acting Chairman*

Room 419, Clement Hall

In the Department of Political Science, graduate students who select Political Science as a major will consult their major adviser as to the program of study. The basic requirements are as follows:

Prerequisite: a minimum of 18 semester hours, except in special cases approved by the Dean of The Graduate School and the Department of Political Science.

Requirements: (1) a minimum of 21 semester hours in graduate courses, at least 15 of which must be in the 7000 level courses; (2) each student must complete a thesis (6 hours); (3) graduate Political Science majors must pass an oral comprehensive examination in the major and collateral fields before being recommended for graduation; and (4) each student must pass a reading knowledge examination of an approved foreign language or show, in approved cases, a working knowledge of statistics.

For the collateral area, 9 semester hours as approved by the adviser, are required.

- 6101. Scope and Method of Political Science Research. (3).**
Review and evaluation of the philosophical concepts, approaches, and methodologies applicable in political science.
- 6102. Political Behavior. (3).**
An introduction to the contributions of the behavioral sciences to an understanding of the political system. Political behavior is examined as manifested in the formation of attitudes, public opinion, group organization, and political power.
- 6211. The Constitution: Governmental Structure and Relationships. (3).**
An analysis of the relationships and controls of the three branches and the nature of the division of power between the nation and the states, with emphasis on the role of the Supreme Court as the arbiter in the constitutional system.
- 6212. The Constitution: Political and Civil Rights. (3).**
An examination of the judicial interpretation of the political and civil rights with emphasis on the period since 1875.
- 6213. Development of United States Domestic Policy. (3).**
A study of the formation and execution of selected domestic policies (fiscal, economic, agriculture and conservation, welfare, grants-in-aid) with a detailed examination of the political and administrative environment of governmental decision making.
- 6214. The Executive Process. (3).**
A detailed study of the role of the executive in American politics.
- 6215. The Judicial Process. (3).**
An examination of the structure of the legal system and the role of the judiciary in government and politics. Emphasis is on the American legal system and the factors which enter into judicial decision-making including political, social, economic, and psychological factors.
- 6217. The Legislative Process. (3).**
The origins, organization, functions, and activities of the modern legislature; making laws, supervising the administration, representing and informing the people.
- 6221. State and Local Developmental Administration. (3).**
Problems and issues in the administration of economic, social, and political development; planning, organizing, and programming of change, technical assistance, and resource administration.
- 6224. Municipal Problems. (3).**
A study of selected problems in municipal administration (organization, personnel, fiscal, planning).
- 6301. British Government and Politics. (3).**
The nature and development of the British Constitutional system. Special emphasis will be placed on the Cabinet, Parliament, and the Commonwealth organization and function.
- 6305. Soviet Government and Politics. (3).**
Organization and function of the authoritarian state, with emphasis on the role of the Communist Party and ideology.

6306. **Contemporary Latin American Politics.** (3).
A study of contemporary problems in Latin American politics and inter-American relations.
6401. **Modern Political Ideologies.** (3).
A study of authoritarianism and democracy as represented by a comparison of democracy, socialism, communism, and fascism.
6405. **American Political Thought.** (3).
An analysis of political thought in the United States from the colonial to the present time, with emphasis placed on the relation between political thought and political institutions and practices.
6501. **Contemporary Problems in International Politics.** (3).
A study of contemporary problems in international relations with emphasis on the major powers.
6502. **Soviet Foreign Policy.** (3).
Basic concepts about Soviet foreign policy; development and techniques; present patterns of Soviet relations with key nations; major problems in future relationships.
6504. **International Law.** (3).
An analysis of the nature, scope, duties, rights, and evolutionary trends of international law.
6505. **World Communist Movement.** (3).
A study of the development of the World Communist Movement from its inception to the present: its Leninist origins; the Bolshevization and Stalinization of the movement; the rise of other national communist parties; the Sino-Soviet conflict and "polycentrism."
6506. **Problems in American Foreign Policy.** (3).
A study of American foreign policy problems taken from specific areas or issues of policy.
6601. **Policy and Administration.** (3).
A study of the role of the administrator in the formulation of public policy; an examination of the processes, problems, and effects of executive influence in legislation and adjudication.
6604. **Problems of Public Administration.** (3).
An examination of the administrative processes, including an investigation of laws, the powers, procedures, and the limitations upon administrative offices and agencies.
7106. **The Political System.** (3).
A systematic analysis of the elements of the political system, showing the interrelationship of political culture (values, beliefs, attitudes, consensus), the formal and informal patterns of power, the patterns of interest, and the pattern of policy.
7201. **Seminar in U. S. Political Institutions and Thought.** (3).
A study of the development of major political institutions and thought.
7212. **Seminar in Constitutional Problems.** (3).
7213. **Seminar in Judicial Decision-Making.** (3).
An analysis of recent research in judicial decision-making, including the application of statistical techniques.

- 7216. Seminar in Political Behavior. (3).**
Genesis of political parties and pressure groups as political institutions. Study of political dynamics including the role and function of parties and pressure groups in the legislative, executive, and electoral processes.
- 7224. Seminar in Metropolitan Problems. (3).**
A consideration of the problems inherent in the growing urban developments in the United States. The governmental organization of metropolitan areas and the difficulties of coordination of government functions. Proposed remedies and the reception of new approaches in selected metropolitan areas.
- 7225. Seminar in Problems in State Government. (3).**
Selected policy making processes and policy problems arising from the operation of legislative, administrative, and judicial machinery. Special attention will be given to Tennessee.
- 7301. Seminar in Comparative Political Institutions and Thought. (3).**
Comparative study of the development of political institutions and thought in major world government.
- 7302. Seminar in Comparative Politics. (3).**
Study of selected problems in comparative politics.
- 7401. Seminar in Political Theory. (3).**
Study of selected topics involving the development of political thought.
- 7501. Seminar in International Politics. (3).**
A study of selected problems in international politics.
- 7605. Seminar in Politics and Administration. (3).**
Explanation of problems stemming from the relationships of politics and administration, stressing relevant analytical approaches and research methods.
- 7615. Special Problems. (3).**
May be repeated for a total of six credits. Independent investigation of a research problem or directed readings in a selected area of political science. **PREREQUISITE:** Permission of instructor.
- †7996. Thesis. (3-6).**
The student must write and defend satisfactorily a thesis on a subject approved by his major professor.

†Grades of S, U, or P will be given.

PSYCHOLOGY

PROFESSOR ROBERT VIDULICH, *Chairman*
Room 211, Johnson Hall

In the department of Psychology, permission to pursue a Master's degree is granted on a competitive basis. In order to be considered for master's work, the applicant should meet the following prerequisites:

1. An overall undergraduate grade-point average of at least 2.5 (out of 4.0). Applicants with undergraduate records at this minimum level are not ordinarily admitted. Strong supporting guidance will be required of such applicants.

2. A minimum of 18 semester hours in undergraduate psychology courses, including Quantitative Methods, Learning and Behavior Modification, and Experimental Psychology. A student lacking these prerequisite courses but presenting an exceptional undergraduate record may be granted graduate admission and should remove the deficiencies as early as possible. In other cases, an applicant may be admitted as a special student, his application for graduate status being deferred until the deficiencies are removed.
3. Satisfactory performance on the aptitude section of the Graduate Record Examination.
4. Letters of recommendation from at least two persons familiar with the applicant's background and aptitude for graduate work.

In the Department of Psychology, permission to pursue the Ph.D. degree is also selectively granted on a competitive basis. In order to be considered for advanced graduate work in the Ph.D. program, the applicant must meet the following requirements:

1. Have satisfactorily completed all requirements for the Master of Science degree in Psychology at Memphis State University, or hold an equivalent master's degree from another institution. No applicant will be considered for the Ph.D. program who holds a non-thesis degree until he has completed, at Memphis State University, the additional requirements of this Department for the M.S. degree. Outstanding prior work in graduate studies will be expected of all applicants.
2. Satisfactory performance on the aptitude section, and on the Psychology advanced test, of the Graduate Record Examination.
3. Letters of recommendation from at least three persons familiar with the applicant's academic background and aptitude for advanced graduate work.

The student granted graduate status should consult his graduate faculty advisory committee to determine his program of study. The student may work toward the M.A. Degree or the M.S. Degree in Psychology or the M.A. Degree in School Psychology, the choice of degree programs depending on the student's interests and goals. The student pursuing the M.A. or M.S. Degree in Psychology is urged to complete all his work for the degree in the Department of Psychology, though under special circumstances he may take a collateral in an area approved by his advisory committee.

7101. History and Systems of Psychology. (3).

An analysis of the philosophical and scientific antecedents of contemporary psychology, including examination of historically and currently important theoretical systems and discussion of problems of conceptualization and theory construction. PREREQUISITES: Psychology 4101 or equivalent, or consent of instructor.

7102. Physiological Psychology. (4).

A comprehensive study of the relationships between physiological processes and behavior. The anatomy and physiology of the nervous system will be reviewed. Major emphasis is on various functional systems such as attention, activation, regulation, and on the topics of learning and memory. PREREQUISITES: Psychology 4201 or equivalent, or consent of instructor.

Three lecture, two laboratory hours per week.

7103. Comparative Psychology. (4).

A comprehensive examination and synthesis of the principles, concepts, and findings of ethology and comparative psychology. Similarities and differences in theories, methods, and research findings

related to such basic psychological problems as the effective stimulus, the drive concept, and acquired vs. innate behaviors will be examined. PREREQUISITES: Psychology 4202 or equivalent, or consent of instructor.

Three lecture, two laboratory hours per week.

7104. Psychological Appraisal. (3).

A survey of the empirical foundations of psychological assessment. Research on the interpretation and evaluation of a variety of measurement devices will be reviewed. The role of assessment in the modification of behavior will be discussed. PREREQUISITES: Psychology 3304 or equivalent, or consent of instructor.

7201. Theories of Learning. (3).

Examination and discussion of the major contemporary theories of learning. Attention is given to the basic assumptions, logical structure, and empirical support for the theories of Spence, Skinner, Estes, and Logan. In addition, briefer consideration is given to theories of considerable historical importance such as those of Guthrie, Tolman, and Hull. PREREQUISITES: Psychology 3201 or equivalent, or consent of instructor.

7202. Theories of Personality. (3).

A survey of major contemporary theories of personality, with particular emphasis on the etiology and treatment of psychopathological states as interpreted within various theoretical frameworks. PREREQUISITES: Psychology 3101 or equivalent, or consent of instructor.

7205. Social Psychology. (4).

A survey of the theoretical and research literature pertaining to current topics in social psychology excluding intra- or inter-group behavior, including attitude formation and change, inter-personal perception and behavior, social motivation, communication and persuasion, and social influence and conformity. PREREQUISITE: Psychology 3302 or equivalent or consent of instructor.

7206. Group Processes. (4).

Social psychology of groups and organizations, including social influence, leadership, and inter- and intra-group behavior. PREREQUISITE: Psychology 3302 or equivalent, or consent of instructor.

Three lecture, two laboratory hours per week.

7207. Developmental Psychology. (3).

A detailed examination of developmental processes across species. Primary emphasis is placed on the variables contributing to normal development of species-characteristic abilities and patterns of behavior. PREREQUISITE: Psychology 3103 or equivalent, or consent of instructor.

7208. Psychology of Perception. (4).

An examination of the historical development, research, and major theoretical positions in the area of perceptual psychology. Major emphasis is placed on theoretical and experimental treatment of the basic perceptual phenomena. PREREQUISITE: Psychology 4203 or equivalent, or consent of instructor.

Three lecture, two laboratory hours per week.

7209. Sensory Psychology. (4).

A structural and functional examination of the basic sensory systems. The problems of sensory quality and sensory quantity will be investi-

gated with major emphasis on visual acuity, color vision, pitch discrimination, and haptic sensitivity. PREREQUISITE: Psychology 4203 or equivalent, or consent of instructor.

Three lecture, two laboratory hours per week.

7210. Psychology of Learning. (4).

Examination and discussion of current research, and of theoretical and experimental problems in the area of learning and behavior modification. Topics covered include reinforcement, punishment, secondary reinforcement, extinction, motivation, generalization, discrimination, retention, and forgetting. PREREQUISITE: Psychology 7201, or consent of instructor.

Three lecture, two laboratory hours per week.

7211. Cognitive Processes. (3).

Analyses of thinking, conceptualization, language and symbolic activity, and related mediational processes in the individual. PREREQUISITE: Psychology 3303 or equivalent, or consent of instructor.

7212. Industrial Psychology. (3).

The application of psychological principles and findings to industrial settings analyzing personnel selection, classification and evaluation, employee attitudes, morale, and motivation, and psychological factors in work. PREREQUISITE: Psychology 3301 or equivalent, or consent of instructor.

7213. Theoretical and Empirical Problems in Psychology. (3).

A detailed survey of the philosophical and logical antecedents and problems in psychology as a science, covering such topics as empirical methods in psychology, psychological data language, theory construction, probability and inference, and inductive procedures. PREREQUISITE: Psychology 7101 or equivalent, or consent of instructor.

7301. Quantitative Methods. (4).

Statistical inference applied to problems in psychological experimentation. Elementary probability, statistical distributions, classical and nonparametric statistics will be covered. PREREQUISITES: Psychology 2301 or equivalent, or consent of instructor.

Four lecture hours per week.

7302. Research Design and Methodology. (4).

The emphasis will be on mathematical and nonmathematical analyses of psychological data, theoretical and experimental implications of different analyses, various data collection techniques, and types of experimental and statistical control. PREREQUISITES: Psychology 7301, or consent of instructor.

Four lecture hours per week.

7303. Multivariate Analysis. (3).

Partial and multiple correlation, factor analysis, cluster analysis. Practice in applying these techniques, with emphasis on the logic of such statistical techniques for psychology. PREREQUISITES: Psychology 7301, or consent of instructor.

7304. Measurement Theory and Psychometrics. (3).

Measurement theory involved in the construction and evaluation of psychological measuring instruments will be stressed. Particular emphasis will be placed on scaling methods and their use in psychological research and evaluation. PREREQUISITES: Psychology 7301, or consent of instructor.

7308. Behavioral Instrumentation. (3).

Detailed examination of instrumentation techniques in behavioral psychology including specific study of basic electronics appropriate to psychological equipment circuit construction, programming, and stimulus presentation techniques, and to the design and construction of behavioral research equipment. PREREQUISITE: Consent of instructor.

Two lecture, two laboratory hours per week.

7309. Physiological Techniques. (3).

Detailed examination of various techniques used in research in physiological psychology, covering such topics as surgical and histological procedures, cortical lesions and implants, perfusion, and electrophysiological recording. PREREQUISITE: Psychology 7102, or consent of instructor.

Two lecture, two laboratory hours per week.

7310. Programmed Instruction. (3).

The application of principles of reinforcement contingencies to self-instruction devices. Historical development, research findings, programming, and evaluation will be covered. PREREQUISITE: Consent of instructor.

7401. Theories of Psychotherapy. (3).

A comparative examination of the principles and techniques of psychotherapy associated with major theorists in this area. Relevant clinical and experimental research will be surveyed to emphasize the similarities and differences between various approaches. PREREQUISITES: Psychology 7202 and Psychology 7412, or consent of instructor.

7402. Psychodiagnostics I: Intellectual Assessment. (3).

The measurement of intelligence and intellectual deficits. Emphasis on the development and evaluation of, and practice in administering, individual intelligence tests and measures of specific intellectual functions. PREREQUISITES: Psychology 7104, or consent of instructor.

7403. Psychodiagnostics II: Personality Assessment. (3).

An examination of the various psychometric techniques for assessing personality functioning. Objective measures (e.g., MMPI) and projective measures (e.g., Rorschach) will be covered in detail. PREREQUISITES: Psychology 7202 and 7412, or consent of instructor.

7412. Psychopathology. (3).

A survey of the manifestations of abnormal behavior and psychological processes. Detailed analysis of the clinical and experimental literature concerning psychological and psychiatric disorders and their etiology. PREREQUISITES: Psychology 7202, or consent of instructor.

7413. Introduction to Mental Retardation. (3).

A comprehensive introduction to the psychological, genetic, physiological and social aspects of mental subnormality. Consideration of classification systems, syndromes, etiology and prognosis of mental retardation in children and adults. PREREQUISITES: Consent of instructor.

7414. Diagnosis and Treatment of Mental Retardation. (3).

Comprehensive study of interdisciplinary approaches to the diagnosis and treatment of the retardate and other patients with handicapping

conditions. Special emphasis is given to consideration of the handicapped child as understood by various professional disciplines concerned. **PREREQUISITES:** Psychology 7413, or consent of instructor.

†7415. **Sensitivity Training. (3).**

This course is required of all advanced clinical psychology majors and is a prerequisite to the Clinical Practicum in Psychological Treatment Psychology 7612). The course is designed to enhance self-awareness and clinical sensitivity through involvement as a participant observer in the development and continuing functioning of a small group. Emphasis will be on emergent styles of interaction in roles, both explicit and implicit, inherent in the group structure. **PREREQUISITE:** Psychology 7401 or equivalent, or consent of instructor. *Only pass-fail grades will be given, and the credit is not applicable to any degree.*

7501. **Seminar: General Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in psychology of a general-theoretical nature.

7502. **Seminar: Physiological Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of physiological psychology.

7503. **Seminar: Experimental Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of experimental psychology.

7504. **Seminar: Comparative Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of comparative psychology.

7505. **Seminar: Social Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of social psychology.

7506. **Seminar: Clinical Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of clinical psychology.

7507. **Seminar: Industrial Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of industrial psychology.

7508. **Seminar: Mental Retardation. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of mental retardation.

7509. **Seminar: School Psychology. (3).**

(May be repeated for a maximum of 9 credits). Systematic study of current topics in the field of school psychology.

7510. **Seminar: Organizational Psychology. (3).**

(May be repeated for a maximum of 9 credits.) Systematic study of current topics in the field of organizational behavior.

‡7601. **Research Practicum: General Psychology. (1-3).**

(May be repeated for a maximum of 9 credits). Individualized advanced laboratory of field research activities in general psychology.

- †7602. **Research Practicum: Physiological Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Individualized advanced laboratory research activities in physiological psychology.
- †7603. **Research Practicum: Experimental Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Individualized advanced laboratory research activities in experimental psychology.
- †7604. **Research Practicum: Comparative Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Individualized advanced laboratory or field research activities in comparative psychology.
- †7605. **Research Practicum: Social Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Individualized advanced laboratory or field research activities in social psychology.
- †7606. **Research Practicum: Clinical Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Individualized advanced laboratory or field research activities in clinical psychology.
7610. **Clinical Practicum: Diagnostic Methods.** (1-3).
(May be repeated for a total of 6 credits). The advanced clinical psychology student will receive supervised experience in the use of psychodiagnostic techniques in various community settings. **PREREQUISITES:** Psychology 7402 and 7403, or consent of instructor.
7611. **Field Practicum: Social-Industrial Psychology.** (1-3).
(May be repeated for a maximum of 9 credits). Seminar discussion and supervised experience in the application of basic psychological procedures and principles to social, personnel, and organizational activities in various industrial, military, and community settings. **PREREQUISITES:** Psychology 7205, or consent of instructor.
7612. **Clinical Practicum: Psychological Treatment.** (1-3).
(May be repeated for a total of 6 credits). The advanced clinical psychology student will receive supervised experience in the practice of psychotherapy and behavior modification techniques in various community settings. **PREREQUISITES:** Psychology 7401, or consent of instructor.
7613. **Clinical Practicum: Mental Retardation.** (1-3).
(May be repeated for a total of 3 credits). Didactic training and supervised experience in the application of psychological assessment and treatment procedures to persons with mental retardation and related disorders. **PREREQUISITES:** Psychology 7413 and 7414, or consent of instructor.
7614. **Practicum: School Psychology.** (1-3).
(May be repeated for a maximum of 6 credits.) Supervised experience in the use of psychological procedures in educational settings. **PREREQUISITE:** Psychology 7402 or equivalent, or consent of instructor.
7615. **Special Problems.** (1-3).
(May be repeated for a total of 6 credits). Independent investigation of a research problem, or directed readings, in a selected area of psychology chosen in consultation with the instructor. **PREREQUISITES:** Consent of instructor.

†7996. **Thesis.** (1-3).

Independent research for Master's degree. Application for writing a thesis must be filled out on an approved form after consultation with major professor and filed with the Dean of The Graduate School.

†9000. **Dissertation.** (1-9).

Independent research for Doctor of Philosophy degree. Application for writing a dissertation must be filled out on an approved form after consultation with the major professor and filed with the Dean of The Graduate School.

†Grades of S, U, or P will be given.

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR CHARLES NEWTON, *Chairman*

Room 124, Clement Hall

In the Department of Sociology, graduate students who select sociology as a major area will consult with the chairman of the Graduate Committee in the department as to their program of study. The following courses are required of *all* majors: Sociology 7110, 7210, 7320, and 7996 (Thesis). Each student majoring in sociology shall be required to pass a reading examination in an approved foreign language or satisfactorily complete an approved computer-statistics course of study. It is the responsibility of each student to obtain copies of "Degree Requirements for Masters of Arts Degree" and "Required Reading List" from the department office for detailed descriptions of requirements.

For the collateral area, 9 semester hours as approved by the adviser, are required.

SOCIOLOGY

6211. **Modern Sociological Theories.** (3).

European contributions, American developments, recent trends and influences in sociological theory.

6222. **History of Social Thought.** (3).

Emphasis on the historic sources of social ideas in Western culture in terms of their relevance to contemporary systematic theory.

6412. **Urban Research.** (3).

Extensive exploration of research methods that have proved useful in the study of urban social phenomena; the application, limitations, and advantages of various research approaches. **PREREQUISITE:** Sociology 2410 or permission of instructor.

6413. **Urban Theory Seminar.** (3).

A seminar course in sociological theories of urbanism and urbanization. Analysis of both historical and contemporary theories.

6522. **Analysis of Juvenile Delinquency.** (3).

Trends of juvenile delinquency; the development of case study techniques and diagnosis of juvenile delinquency; comparative analysis of various theoretical approaches.

6610. **Population.** (3).

Population theories and policies; their definition and history. Trends in population growth; methods of population analysis, and trends in

fertility and mortality. Emphasis on fertility, mortality, sex and age composition, and migration and their influences on population change.

6620. Human Ecology. (3).

Spatial structure and land use patterns of urban, rural, and fringe areas; city growth, its spatial and communicative extension into suburban and rural areas, and its impact on the economy, values and social organization of communities.

6720. Collective Behavior. (3).

Emergence of collective behavior, spontaneous collectivities, social movements, social consequences of restrictive collective behavior.

6830. Directed Individual Study. (1-4).

Individually directed advanced reading and/or research in special areas of interest. PREREQUISITE: permission from departmental chairman.

6842. Occupations and Professions. (3).

Sociological analysis of the division of labor, occupational groupings, career patterns, and professional associations in modern American society.

6851. Medical Sociology. (3).

The contributions of sociology to medicine; the sociology of illness, particularly mental illness; practitioners, patients and medical settings, particularly the modern hospital; the organization and the sociology of the distribution of medical care; the status and the methods of research in medical sociology.

7010. Seminar in the Sociology of Deviant Behavior. (3).

A seminar in the sociological approaches to the study of deviance and social disorganization with an emphasis on current sociological theory and research. PREREQUISITE: Graduate standing, Sociology 7110 (Pro-seminar) or equivalent and consent of instructor.

7110. Proseminar. (3).

Review and integration of major propositions, concepts, and methods from the various fields of sociology in their current state.

7210. Theory Seminar. (3).

An advanced analysis of recent developments in sociological theory, including the relationship of theory to empirical research.

7230. Systems Theory Seminar. (3).

The advanced analysis of specialized sociological systems as developed by American and European sociologists.

7320. Seminar in Methods of Social Research. (3).

A seminar dealing with: (1) advanced statistical methods, including experimental design, the analysis of stochastic processes, and similar procedures; and (2) the general methodology of social research, including such topics as the location of research problems, the structure of arguments, the nature of evidence, and the more general logic of social research.

7413. Urban Theory Seminar. (3).

A seminar in sociological theories of urbanism and urbanization. Analysis of both historical and contemporary theories. PREREQUISITE: Graduate standing, and consent of instructor.

7420. Readings in Contemporary Family Life. (3).

An advanced course in the study of the family which is primarily concerned with research findings in the areas of family disorganization, changes in family structure and function, parent-child interaction, working mothers, and problems of aging.

7440. Social Stratification. (3).

This course will examine the theories of Marx, Weber, Warner, Parsons, and Bendix among others. Furthermore, this course will encompass the study of the relationship between class, prestige, life-style and ideology in a cross cultural perspective. Finally, it will also examine the factors relating to the increase and decrease rates of social mobility.

7460. Formal Organizations. (3).

The relationship between organizational structure, ideology, and interaction patterns.

7610. Techniques of Population Analysis. (3).

An analysis of the sources of population data and the techniques for utilizing these data in population research and in other forms of social research in which population data are a meaningful part.

7810. Racial and Cultural Minorities. (3).

A study of the empirical and conceptual aspects of minority status as determined by racial and cultural criteria.

7880. Sociology of Knowledge. (3).

Systems of thought, including metaphysical theories and social and political philosophies are studied from the standpoint of their causal interdependence with social structures and processes. **PREREQUISITE:** Graduate standing, and consent of instructor.

†7996. Thesis. (3-6).

Supervised research in preparation for advanced degree thesis. **PREREQUISITE:** The formal filing of a research proposal and outline of procedures acceptable to the student's graduate committee.

LAW ENFORCEMENT

6523. Techniques of Criminal Investigation. (3).

A description, analysis, and demonstration of historical and contemporary techniques and procedures utilized in the apprehension of the criminal.

6524. Penology. (3).

The historical and contemporary analysis of penal systems and reformatories in terms of organization, procedures, programs, and effectiveness.

6525. Probation and Parole. (3).

The analysis of various release procedures and their effectiveness from a historical, philosophical, and sociological point of view.

6526. Police Administration. (3).

A comparative analysis of the problems, procedures, organization, and functions of effective police organization.

6527. Law Enforcement and the Criminal Law. (3).

The analysis of those aspects of police and law enforcement procedures

and techniques as these apply to local, state, and federal criminal statutes.

ANTHROPOLOGY

6065. History of Anthropological Theory. (3).

The growth of theory and method in anthropology leading to modern historical, sociological, and psychological interpretations. PREREQUISITE: Permission of instructor.

6251. Social Structures of Non-Literate Societies. (3).

Comparative analysis of social structures and their functional relationships to other cultural institutions, with emphasis on family types, marriage patterns, and kinship. PREREQUISITE: Anthropology 1200 and at least one survey or area course in ethnology; or permission of instructor.

6252. Economic Systems of Non-Literate Societies. (3).

Comparative analysis of economic systems and their functional relationships to other cultural institutions; production, distribution, and consumption in non-literate groups; concepts of wealth, value, property, and ownership. PREREQUISITE: Anthropology 1200 and at least one survey or area course in ethnology; or permission of instructor.

6253. Religious Systems in Non-Literate Societies. (3).

Comparative analysis of religious systems and their functional relationships to other cultural institutions; inter-relations of myth, magic, and ritual; types of religious institutions and religious practitioners.

6254. Culture Change in Non-Literate Society. (3).

Internal and external factors causing change in the small-scale society; theories of cultural evolution; social changes involved in the emergence of civilization; changes involved in industrialization.

6255. Political Systems in Non-Literate Societies. (3).

Comparative analysis of political systems and their functional relationships to other cultural institutions; formation and segmentation of political structures; requisites of leadership and political control.

6751. Culture and Personality in Non-Literate Society. (3).

Comparison of factors involved in the analysis of personality as contrasted to culture; the interaction of these factors; problems of studying personality cross-culturally.

6752. Applied Anthropology. (3).

Applications of anthropological knowledge and techniques to contemporary problems in government, industry, public health, and colonial and native administration. Emphasis on, but not limited to, contacts between industrial and non-industrial societies. PREREQUISITE: 12 semester hours of anthropology and permission of the instructor.

6975. Directed Individual Readings. (2).

Intensive guided survey of anthropological and related literature dealing with topics selected by advanced students and accepted by the staff. Compilation, synthesis, and evaluation of the published data; preparation for graduate level work, for students considering anthropology as a profession. Enrollment limited to anthropology majors and minors. PREREQUISITE: Permission of staff.

7231. Seminar in New World Ethnology. (3).

Intensive studies of selected cultural topics, utilizing data derived from ethnic groups of North and South America.

7242. Seminar in Old World Ethnology. (3).

Intensive studies of selected cultural topics, utilizing data derived from ethnic groups of Europe, Asia, and Africa.

7331. Seminar in New World Archaeology. (3).

Intensive studies of selective cultural topics, utilizing data derived from prehistoric sites in North and South America. **PREREQUISITE:** Graduate standing.

7342. Seminar in Old World Archaeology. (3).

Intensive studies of selected cultural topics, utilizing data derived from prehistoric sites in Europe, Asia, and Africa.

†Grades of S, U, or P will be given.

SPECIAL EDUCATION

PROFESSOR LEO J. KELLY, *Chairman*

Room 401, The College of Education Building

A student seeking a Master of Education degree in Special Education is required to complete a core sequence of nine semester hours. This core consists of:

Education 7001, 7511 and 7521

Additional requirements are as follows:

1. Master of Education in Special Education (Mental Retardation)

Courses required: Special Education *6151, *6162, *6163, *6164 or *6165, 7151, 7161, 7162 and three semester hours of electives. Total 33 semester hours.

2. Master of Education in Special Education (Crippled and Special Health Problems)

Courses required: Special *6151, *6152, *6162, *6172, *6781, 7151, 7152, and three semester hours of 7000 level special education electives. Total 33 semester hours.

6131. Education of the Talented and Mentally Gifted. (3).

A course that gives an overview of the education of gifted children. The students will be exposed to a historical perspective of the area, identification approaches, characteristics, organization of programs and services for the gifted and the role played by personnel working with the gifted. **PREREQUISITE:** Sp Ed 6151.

6151. Education of Exceptional Children. (3).

A survey course which deals with the general problems involved in education of exceptional children.

6152. Working with Parents of Exceptional Children. (3).

This course is designed to teach the techniques which an educator might use in communicating with parents of exceptional children. It covers various means of interpreting school programs and handicapping conditions to parents in order to get maximum home reinforcement of the attitudes, skills and knowledge taught in school.

- 6162. Education and Rehabilitation of the Cerebral Palsied. (3).**
The content of this course deals entirely with the cerebral palsied. Etiology, diagnosis, characteristics, educational planning, vocational training, and placement are covered. Emphasis is also placed on the development of social, communications, and mobility skills. **PREREQUISITE:** Sp Ed 6151.
- 6163. Introduction to Mental Retardation. (3).**
A study of the historical treatment of the mentally retarded, as well as etiology and characteristics of the mentally retarded. Methods of diagnosing, placing and working with mentally retarded pupils will be covered from the view-point of an interdisciplinary approach.
- 6164. Curriculum Development and Techniques of Teaching Elementary Educable Mentally Retarded Children. (3).**
This course is designed to give background information in curriculum approaches that have been used in teaching mentally retarded. There is a stress placed on the principles of curriculum development in order to encourage the coordination which is so important in developing a sequentially-related curriculum at the pre-school, primary, and intermediate levels. The approach advocated in this course will be centered around the construction and teaching of experience-centered units.
- 6165. Curriculum Development and Techniques of Teaching Secondary Educable Mentally Retarded Children. (3).**
A course stressing the development of an experience-centered unit approach to teaching educable mentally retarded children at the Junior High and Senior High levels. Vocational assessment, working with other disciplines, personal development and strengthening deficiencies will be emphasized in the curriculum development.
- 6166. Programming for Trainable Mentally Retarded Children. (3).**
This course covers diagnosis, classification, development of teaching materials and techniques as well as working with community organizations in relation to a public school, private school, community center or institutional program for trainable mentally retarded children.
- 6171. Education of Hospitalized and Homebound Children. (3).**
This is an orientation to the general and specific problems of the hospitalized and homebound child.
- 6172. Educational and Medical Aspects of Crippling and Special Health Conditions. (3).**
This course consists of a detailed study of the various types of physically disabling conditions (poliomyelitis, cleft palate, arthritis, measles, and other commonly injurious conditions) which cause either temporary or permanent decreases in educational proficiency. Special methods of instruction for these health conditions would be studied along with suitable adaptations of materials for such afflicted children within the framework of the public school organization.
- 6174. Supervised Clinical Training in Educational Therapy. (6).**
Practical application of educational activities in the rehabilitation of patients with neuropsychiatric, orthopedic, neurological cardiac, pulmonary, and other general disabilities; included are such procedures as Braille, speech therapy, general educational development, literary training, and other vocational subjects.

6175. Principles and Procedures of Rehabilitation. (3).

A panorama of the principles and procedures of rehabilitation necessary for developing and coordinating community resources for the disabled.

6176. Introduction to Children with Learning Disabilities. (3).

An introductory course giving an overview of minimal brain dysfunction and the theories concerning the diagnosis, management, and education of children, with resulting learning disabilities. The course acquaints the students with the behavioral characteristics of children with learning disabilities and relates this to academic failure. PREREQUISITE: Sp Ed 6151.

6181. Methods and Materials for Teaching Visually-Handicapped Children. (3).

A course primarily designed for teachers of the partially-seeing and blind within the framework of public schools, consisting of study in the growth and development of visual imbalance, and the environment and educational implications of visual problems; the historical background of special programs in the education of the visually-handicapped, and the adaptation of educational methods and materials to the teaching of such handicapped children.

6182. Introduction to the Teaching of Braille. (3).

A course designed to give the basic fundamentals in Braille instruction, including the introduction of equipment for Braille writing, development of skill in the use of such equipment, the history and development of Braille and other instructional procedures for the blind, and mastery of the Nemeth Code of Mathematics, three-dimensional bulletin boards and equipment, and practicum in the use of these materials.

6192. Education of the Acoustically Handicapped Child. (3).

A course which emphasizes methods of teaching content subjects to deaf and hard-of-hearing children. The utilization of visual and auditory aids is included while special recognition is given the integration of the language arts with instruction of content materials.

6781. Workshop for Teaching Perceptually Handicapped Children. (3).

A workshop for teacher-training in the area of perceptually handicapped children (brain-injured, non-retarded), who demonstrate a learning and/or behavioral disorder, due to a minor or moderate neurological impairment.

6881. Supervised Practicum with the Educable Mentally Retarded. (3-6).

(formerly Student Teaching with the Educable Mentally Retarded)
Orientation, observation, teaching with mentally retarded pupils. PREREQUISITE: Education 4821 or 4822.

6882. Supervised Practicum with Pupils Who Have Crippling and Special Health Conditions. (3-6).

(formerly Student Teaching with Pupils who have Crippling and Special Health Conditions.)
Orientation, observation, teaching with pupils who have crippling and special health conditions. PREREQUISITE: Education 4821 or 4822.

6883. Supervised Practicum with Trainable Mentally Retarded. (3-6).

Orientation, observation, and teaching with trainable mentally retarded pupils. PREREQUISITES: Special Education 4151, 4163, and 4166.

7151. Administering and Supervising Public School Special Education Programs. (3).

This course deals with the major areas of school administration and supervision as they relate to special education. It is designed to prepare special educators to work with placement, in-service training, and supervision of professional personnel, organization of programs, financing and budgeting, physical plant facilities and working with related agencies.

7152. Assessment of Exceptional Children. (3).

A course in which the tests unique to assessing the developmental level and the potential achievement of exceptional children are examined. Emphasis is placed on the use of them for selection and placement of exceptional children in special education programs.

7153. Practicum in the Assessment of Exceptional Children. (3).

Supervised practice in administering, scoring and relating results of tests that are used for selection and placement of exceptional children in special education programs. PREREQUISITE: Education 7152.

7161. Advanced Theory in Curriculum Development for the Mentally Retarded. (3).

A course to teach the theoretical and philosophical foundations for the experience-centered curriculum for the mentally retarded. Research will be studied and evaluated. Issues will be debated and proposals for curricular approaches will be presented and defended.

7162. Vocational Rehabilitation of Mentally Retarded Youth. (3).

This course is constructed to emphasize the educator's function in vocational rehabilitation of mentally retarded youth. It will cover the planning of vocational experiences in the school and out of school settings, the problems of a school vocational counselor placing and supervising his pupils in job training situations, the working with other disciplines and agencies in the community in order to bring about a follow up when the pupil needs help after leaving school.

7171. Advanced Theories in the Classroom Management of Children with Learning Disabilities. (3).

This course will require that the students become thoroughly acquainted with the leading theories in the field of the education of children with learning disabilities. Emphasis will be placed on relating these to classroom methods, management of behavior problems, and the remediation of perceptual-motor problems. PREREQUISITE: Sp Ed 6176.

7246. Teaching Reading to Exceptional Children. (3).
(See Reading).

7994. Special Problems in Special Education. (1-3).

Individual investigation and report in the area of Special Education under the direction of a faculty member.

†7996. Thesis. (3-6).

8151. Trends in Special Education. (3).

A critical analysis of influence, issues and trends in Special Education. This course is designed to prepare leaders in the field of Special Education to be aware of and able to cope with issues and changes as they occur in the field.

8152. Seminar in Special Education Research. (3).

A course designed for people who serve as resource personnel in Special Education. Studies and research pertaining to the education of

exceptional children are critically examined and conclusions as to use and value are made in the view of the major problem areas in the field. The procedures for conducting and reporting research are also studied and compared.

8161. Socio-Cultural and Biological Aspects of Mental Retardation. (3).

A course dealing, in depth, with the current thinking concerning the etiology of mental retardation. Emphasis will be placed upon prevention, treatment and education as important components which our society must recognize when dealing with mental retardation.

8162. Educational Aspects of Mental Retardation. (3).

A course designed to study the educational aspects mental retardation as revealed through research and practical methodology. A critical examination of theories dealing with learning, perception, brain injury, and deprivation, as they relate to mental retardation, will be carried out.

*Not required if equivalent courses taken at the undergraduate levels. (Substitutions must be made by the adviser).

†Grades of S, U, or P will be given.

SPEECH AND DRAMA

PROFESSOR HARRY AUSPRICH, *Chairman*
Room 143, *Speech and Drama Building*

The graduate major in Speech and Drama may specialize in Radio-Television-Film, Rhetoric and Public Address, Speech Education, or Theatre and Oral Interpretation, depending on his undergraduate background and experience. Students who choose to major in Speech and Drama will consult their major adviser as to the program of study. The student may request a non-thesis degree program through his adviser to the departmental graduate committee. Each student's program must include Speech 7100, Bibliography and Methods of Research (3).

For the collateral area, 9 semester hours as approved by the adviser, are required.

6101. Contemporary Theories of Language. (3).

An examination of the influence of language upon behavior, of the limitations of language as a communicative system, and of the relationships between language and thought.

6361. History and Criticism of British Public Address. (3).

A study and analysis of British speakers and speaking from the 16th century to the present time. Emphasis will be placed on the speech situation, audience, issues and speakers. Such men as Fox, Pitt, Sheridan, Burke, Disraeli, and Churchill will be considered.

6362. History and Criticism of American Public Address. (3).

An analysis of political, religious and social speaking from colonial times to the present. Such men as Clay, Emerson, Lincoln, Webster, and the Roosevelts will be considered.

6365. The Tradition of Southern Oratory. (3).

Studies of notable speakers of the South, the rhetorical characteristics of political campaigns and movements, and the impact of different forms of speech-making upon the Southern social structure.

- 6371. Critical Analysis of Oral Communication. (3).**
Problems in the theory and criticism of classical and modern rhetoric works; application of the principles of rhetoric to the critical evaluation of current public speaking practice.
- 6421. Interpretation of Poetry. (3).**
Studies in the style and structure of poetry of specific types and periods, as related to the response and performance of the oral interpreter. PREREQUISITE: Speech 2411.
- 6431. Interpretation of Prose. (3).**
Studies in the oral interpretation of prose fiction, with attention to various literary styles and structures. PREREQUISITE: Speech 2411.
- 6451. Interpretation of Shakespeare. (3).**
Studies in the oral presentation of scenes from selected comedies, histories, and tragedies, with exploration of character and dramatic structure.
- 6551. Studies in Theatre History. (3).**
Special problems in theatre history: the men and ideas which have shaped the theatre of the western world from antiquity to the present.
- 6571. Playwriting. (3).**
A study of the theory and principles of writing plays for the stage. Practice in writing either the short or long play.
- 6581. Dramatic Theory and Criticism. (3).**
The major documents in dramatic theory and criticism from Aristotle to the present.
- 6811. Radio and Television Programming. (3).**
The analysis and planning of radio and television station programming structures and schedules. The role of programming in broadcasting, factors that affect programming, general concepts of station programming.
- 6831. Radio and Television Sales and Advertising. (3).**
The relation of radio and television advertising to the station, network and station representative; the role of sponsors, agencies and other allied groups.
- 6871. Radio and Television Station Management. (3).**
Theories of management; study and analysis of the special problems and situations confronting the manager of the broadcasting station in personnel, operations, government regulations, programming and sales.
- 6891. Techniques of Film. (3).**
Study and evaluation of past and present approaches in the techniques of editing, camera angles, composition, and continuity. Students will also create and produce short films.
- 6892. Film Production. (3).**
Workshop for making films. PREREQUISITE: Speech 6891.
- 6921. Play Production for Secondary Schools. (3).**
A survey of the problems of the play director in high school. The course considers: choosing the play, casting, directing, technical aspects of production; then relates these items to the student, the school, and the community.

6922. Directing the Forensics Program. (3).

Designed for the teacher charged with the responsibility of developing and directing interscholastic or intercollegiate competitive speech programs; the study of the historical background for such programs, organizing techniques, recruiting, tournament direction, and other related concerns.

7100. Bibliography and Methods of Research. (3).

1. The examination of bibliographical aids for the study of rhetoric and public address, speech pathology, theater and oral interpretation, speech education, and radio and television, 2. a survey of the types of research in speech, and 3. the presentation and documentation of scholarly writing.

7103. Experimental Research in Speech. (3).

A survey of the fundamentals of probability and statistics; a study of the experimental research designs commonly found in public address, Radio-TV, Audiology-Pathology, and Theatre; Guided criticism of experimental studies in Speech.

7311. Seminar in Communication Theory. (3).

A survey of contemporary approaches to communication. The course examines semantic and linguistic theories, cybernetic and information theories, attitude formation and change, all based upon the concepts of experimental and philosophical design.

7341. Interpersonal Communication. (3).

Examines current research dealing with human relations, group leadership, and sensitivity training as applied to communication.

7361. The Greek Tradition in Rhetoric and Oratory. (3).

A study of the varying influences on, and movements within, the progressive development of the Greek tradition in rhetorical theory, practice, criticism, and pedagogy from Homer to the Renaissance.

7362. The Roman Tradition in Rhetoric and Oratory. (3).

Development of the Roman tradition in rhetorical thought and practice from Cicero through the English Renaissance.

7363. Modern Rhetorical Theory: 1700 to the Present. (3).

The study of the development of rhetorical theory in England, France, and America with particular emphasis on contributors and movements in the 18th and 19th centuries.

7364. Systems of Argument. (3).

Intensive study of argument as a means of inquiry and persuasion in rhetorical and dialectical discourse. Explorations of relationships between theories of argumentation and forms of speech such as political and legal oratory, discussion, and debate. Readings will be selected from Aristotle, Cicero, Kant, Whately, Burke, Schopenhauer, Toulmin, Ayre, *et al.*

7365. The Rhetoric of Literature. (3).

Examination of rhetorical elements in creative discourse, and the approach to such discourse through the techniques of rhetorical criticism. Special attention to dramatic literature.

7366. Seminar in Rhetorical Style. (3).

Study of the role of language in persuasion with special attention to figurative usage.

7367. **Seminar in Rhetoric and Poetic.** (3).
Examination of the relationships between predominantly persuasive and fictive modes of discourse.
7421. **Seminar in Individual Authors.** (3).
Depth interpretation of the work of a selected author.
7431. **Directing Interpreters Theatre.** (3).
Studies in script preparation; directing techniques for group interpretation of prose, poetry, and drama.
7451. **Seminar in Prosody and Criticism.** (3).
Studies in versification and in the major critical approaches to literature from the oral reader's point of view.
7461. **Studies in Oral Interpretation.**
Advanced work in special problems related to the interpretation of poetry and prose styles.
7471. **Theories of Interpretation.** (3).
Studies in critical, historical, and aesthetic approaches to oral interpretation.
7481. **Research in Oral Interpretation.** (3).
Conference course in advanced study of oral interpretation.
7521. **Stage Direction.** (3).
A study of the principles governing the production of a play from the analysis of the manuscript through its presentation upon the stage. Students will direct scenes or one-act plays as part of their class work. (May be repeated for a maximum of 6 credits.)
7551. **Seminar in Theatre Aesthetics.** (3).
A survey of aesthetic theories affecting the theatre from Classical Greece to the present. Special attention will be given to the study of the inter-relationship of theatre and the other arts. (May be repeated for a maximum of 9 credits.)
7552. **Seminar in American Theatre I.** (3).
A study of the plays, players and playwrights of the American Theatre from its beginnings to the Civil War.
7553. **Seminar in American Theatre II.** (3).
A study of the plays, players and playwrights of the American Theatre from the Civil War to the present.
7554. **Seminar in Directing.** (3).
Specialized study of advanced theories and techniques of directing for the theatre with emphasis on the demands of contemporary theatre architecture. (May be repeated for a maximum of 9 credits.)
7555. **Seminar in Stage Design.** (3).
Specialized study of advanced theories and techniques of theatre design with particular emphasis on the demands of contemporary theatre architecture. (May be repeated for a maximum of 9 credits.)
7556. **Theatre Planning and Management.** (3).
A study of the principles of theatre planning and management for educational and regional theatres. (May be repeated for a maximum of 9 credits.)

- 7557. Research in Asian Drama. (3).**
Conference course in the study of Asian drama from its beginning to the present time. (May be repeated for a maximum of 6 credits.)
- 7558. Seminar in Modern World Drama. (3).**
Conference course in advanced study of world drama from approximately 1900 to the present with emphasis on recent trends in playwriting and production. (May be repeated for a maximum of 6 credits.)
- 7571. Advanced Playwriting. (3).**
A continuation of the theories and practice of playwriting with the object of achieving a finished script, ready for production. **PREREQUISITES:** Speech 6571. (May be repeated for a maximum of 9 credits.)
- 7581. Seminar in Dramatic Types. (3).**
A study of the four main types of drama—tragedy, comedy, farce, and melodrama—from classical to modern times. (May be repeated for a maximum of 6 credits.)
- 7582. Research in European Drama. (3).**
Conference course in advanced study of the drama of Europe from the Middle Ages to 1900. (May be repeated for a maximum of 6 credits.)
- 7583. Research in Theatre. (3).**
Research in specialized areas of drama and theatre, such as dramatization of American and/or English literature; history of English and American drama criticism; Renaissance treatises on theatre art and architecture; history of costume, *et cetera*. (May be repeated for a maximum of 6 credits.)
- 7801. Radio Workshop. (3).**
Students would supervise, produce, and direct programs for Radio Production Center for local commercial stations as well as develop a Radio Tape Network. **PREREQUISITE:** Speech 2881 and 2882 or equivalent.
- 7802. Television Workshop. (3).**
Create and produce programs for WKNO and local commercial stations. **PREREQUISITE:** Speech 3842 or equivalent.
- 7803. Film Workshop. (3).**
Students will create and produce films. **PREREQUISITE:** Speech 6892 or equivalent.
- 7821. Readings in Broadcasting and Film. (3).**
Survey of the literature of broadcasting and film.
- 7841. Television Documentary. (3).**
Student productions of documentaries in both film and videotape together with studies of the best of commercial and educational programs.
- 7842. Techniques for Television Teachers. (3).**
A study of the Techniques involved in producing, teaching, and classroom utilization of instructional lessons, emphasizing the use of visual materials, the teacher's appearance on camera, and methods of lesson preparation, with practical experience in the television studio.
- 7851. Broadcasting and Film Criticism. (3).**
An analysis of criticism in the broadcast and film media to help the student develop his own concepts and techniques of critical art.

7871. Current Trends in Broadcasting. (3).

A study of the most critical issues facing the broadcasting industry today. The emphasis will be on the present and future effect of these issues on radio and television programming, management, and regulation.

7931. Seminar in Problems in Speech Education. (3).

Special study of selected current problems. Individual studies will be pursued with group analysis and discussion at regular class meetings.

7991. Seminar in Comparative Media. (3).

To demonstrate through intensive analysis what happens to the form and content of a creative work in its various adaptations; novel, condensation, stage, movie, and television. **PREREQUISITE:** Open to all Speech and Drama majors and English majors.

7993. Special Problems. (1-3).

Individual investigation of special research projects not included in thesis.

7994. Special Problems. (1-3).

(Same As Above)

†7995. Production Thesis. (3-6).

Creative performance or production project suitable for public presentation. Project to be determined in consultation with and directed by the student's supervisory committee.

†7996. Thesis. (3-6).

†Grades of S, U, and P will be given.

DIVISION OF SPEECH PATHOLOGY AND AUDIOLOGY

PROFESSOR GEORGE R. SIMON, *Director*

Programs leading to the MA or MS degree are offered with a major in audiology or speech pathology. The student will consult with his adviser for his program including deficiencies which must be completed. The student may pursue either a thesis or non-thesis program following consultation with his adviser.

Thesis program minimum requirements:

- a. 42-45 semester hours of course work with 28-30 semester hours, exclusive of thesis, in the major area
- b. 12 semester hours in a collateral area, of which 9 hours must be at the 7000 level
- c. successful completion of written qualifying examinations during the second semester of enrollment
- d. completion of written comprehensive examinations during final semester before graduation
- e. completion of thesis.

Non-thesis program minimum requirements:

- a. the same requirements will be met as above except that course 7008 (Special Project Research) will be required instead of the thesis.

7000. Introduction to Phonetics. (3).

Analysis of the physiological positions and movements in the production of American English phonemes; the International Phonetic Alphabet as applied to American speech.

- 7001. Introduction to Hearing Science. (3).**
The biophysics of the ear with emphasis upon instrumentation and laboratory methods in the study of normal hearing.
- 7002. Introduction to Speech Science. (3).**
Study of normal speech and voice production with emphasis upon instrumentation and laboratory methods including all parameters of voice and articulation.
- 7003. Anatomy and Physiology of the Vocal Mechanism. (3).**
Study of the structures and functions of the neuromuscular systems of respiration, phonation, and articulation.
- 7004. Anatomy and Physiology of the Hearing Mechanism. (3).**
Study of the structures and functions of the human ear; principles of the hearing process.
- 7005. Introduction to Graduate Study. (2).**
- 7006. Language and Speech Development. (3).**
Study of the normal speech and language growth from first vocalization to abstract thought.
- 7008. Special Project Research. (3).**
Non-experimental investigation project required of students not in thesis plan. PREREQUISITE: Permission.
- 7100. Introduction to Audiology. (3).**
Introduce student to the study of aberrant hearing. Emphasis on prevalence, causes, types, and effects of hearing impairments. PREREQUISITE: Permission.
- 7101. Measurement of Hearing. (3).**
Study of the measurement of hearing processes emphasizing experimental and clinical psychoacoustic measurement of various aspects of hearing. PREREQUISITE: Permission.
- 7102. Audiometry: Principles and Practices. (3).**
Study of functional tests of hearing including development, administration, and interpretation. PREREQUISITE: 7100, 7101.
- 7103. Differential Audiometry: Principles and Practices. (3).**
Advanced clinical pure tone and speech audiometric measurements including physical requirements, instrumentation, and interpretations with reference to medical and rehabilitative implications. PREREQUISITE: 7102.
- 7104. Clinical Practicum in Audiology. (2-3).**
Supervised clinical practice in audiology. Students will receive 95 hours of clinical practice for 2 semester hours of credit and 140 hours of clinical practice for 3 semester hours credit. The course may be repeated for a total of 6 semester hours credit. PREREQUISITE: 7102 and permission.
- 7107. Physiological Acoustics. (3).**
A review of the anatomy of the ear, and physical nature of sound. Emphasis is on sound reception and the function of physiology of the middle ear mechanism, and sound conduction in the inner ear; relationships to aberrant functioning will be made. PREREQUISITE: Permission.

- 7109. Medical Aspects of Audiology. (3).**
A comprehensive introduction to acute and chronic hearing disorders traceable to disease and their relationship between the medical and audiological fields. PREREQUISITE: 7103.
- 7111. Experimental Audiology. (3).**
Study of hearing disorders with emphasis on basic research results, principles and investigative techniques and procedures. PREREQUISITE: 7101.
- 7112. Seminar in Audiology: Sensorineural Processes. (3).**
Critical study of the sensorineural hearing processes and disorders. PREREQUISITE: Permission.
- 7200. Introduction to Speech Pathology. (3).**
A study of the principles and methods of the functional and organic disorders of speech and language. PREREQUISITE: Permission.
- 7201. Speech Pathology: Cleft Palate Habilitation. (3).**
Study of the cleft palate speech with emphasis on medical and rehabilitative principles. PREREQUISITE: 7200.
- 7203. Speech Pathology: Voice Disorders. (3).**
Study of voice problems associated with phonation and resonances including laryngectomy voice. PREREQUISITE: 7200.
- 7204. Speech Pathology: Articulation. (3).**
Advanced clinical diagnostic, evaluative, and therapy methods of the parameters of articulation disorders. PREREQUISITE: 7200.
- 7205. Speech Pathology: Stuttering. (3).**
Study of stuttering with emphasis on etiological factors and the management and instruction of stuttering subjects. PREREQUISITE: 7200.
- 7207. Differential Diagnosis of Speech and Language: Tests and Procedures. (3).**
Principles and procedures for tests of language and speech dysfunctions; interpretation and rehabilitation plannings. PREREQUISITE: 7200 or 7300.
- 7208. Practicum in Speech Pathology. (2-3).**
Supervised clinical practice in specific areas of speech/language disorders. Students will receive 95 hours of clinical practice for 2 semester hours credit and 140 hours of clinical practice for 3 semester hours credit. Course may be repeated for a total of 6 semester hours credit. PREREQUISITE: 7200 and permission.
- 7210. Seminar in Speech Pathology. (2-3).**
Concentrated study of selected areas of speech or language disorders. May be repeated for up to 6 hours. PREREQUISITE: Permission.
- 7300. Introduction to Language Pathologies. (3).**
Study of the linguistic, neurological, and physiological theories of language behavior relative to disorders of language. PREREQUISITE: Permission.
- 7302. Introduction to the Study of Aphasia. (3).**
Principles of the language behaviors associated with dysphasia with emphasis on etiologies and symptoms. PREREQUISITE: 7300.

7304. Seminar in Language Behavior and Disorders. (3).

Review of current experimental and clinical research of disorders of language. PREREQUISITE: Permission.

†7996. MA Thesis. (3).

PREREQUISITE: Permission.

†Grades of S, U, or P will be given.

TECHNOLOGY

ASSOCIATE PROFESSOR W. T. BROOKS, *Director*
Room 100, Technology Building

6470. Production Control. (3).

(Also offered as Management 6520)

A study of the elements of production and their coordination.

PREREQUISITE: Technology major or minor.

6480. Plant Layout. (3).

(Also offered as Management 6530)

A study of industrial and educational plants, with emphasis on floor plans and placement of facilities. PREREQUISITE: Technology major or minor.

6490. Time and Motion Analysis. (3).

(Also offered as Management 6540)

A study of work simplification techniques, including analysis of jobs and trades. PREREQUISITES: Technology 6470 and Technology major or minor.

INDUSTRIAL ARTS EDUCATION

Industrial Arts Education is a separate area of the Division of Technology. In the area of Industrial Arts Education, only a collateral may be selected.

At least 12 semester hours are required: Industrial Arts Education 7204, 7596, and 6 hours, as required by the adviser, from the following: Industrial Arts Education 7498; Education 7601 and 6741.

7204. History and Philosophy of Industrial Arts Education. (3).

The historical development of industrial arts education; types of programs, philosophies, and trends as related to the total school program.

7498. Curriculum Building in Industrial Arts Education. (3).

Theoretical background and experimental approach to curriculum improvement in industrial arts on the elementary, junior and senior high school levels.

7596. Current Trends and Issues in Industrial Arts Education. (3).

Investigation of current laboratory arrangements, materials, supplies and methods in instruction compatible with the industrial arts program.

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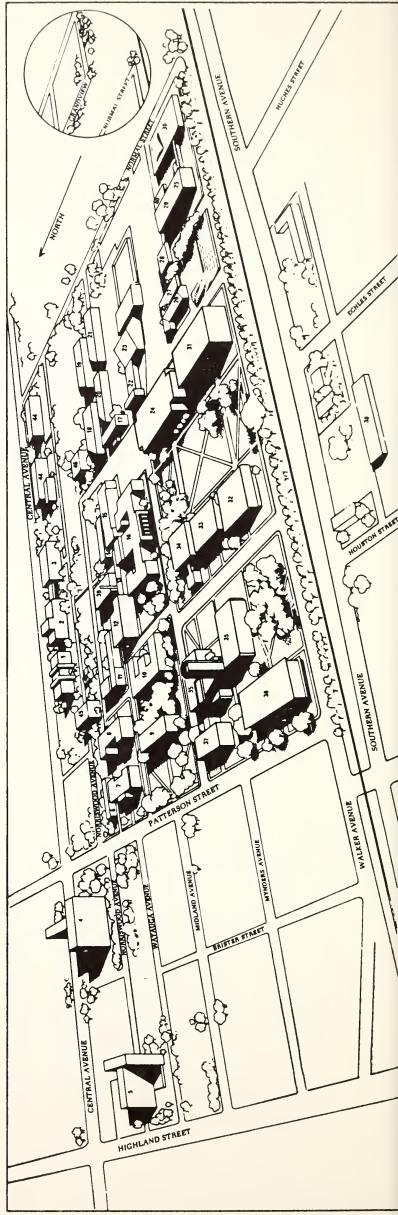
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23. The Field House
24. University Center (Bookstore)
25. Engineering Library
26. Engineering Annex

27. Technology Labs
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29. The College of Education Building
30. University Campus School
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32. Buford Ellington Biological Sciences Building
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36. Malcolm R. Patterson Building
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40. Athletic Office
41. Alumni House
42. Art Annex
43. President's Home
44. Engineering*
45. Psychology Building*
46. Student Health Center
- *Completion Expected in 1969-70



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Memphis, Tennessee 38111

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